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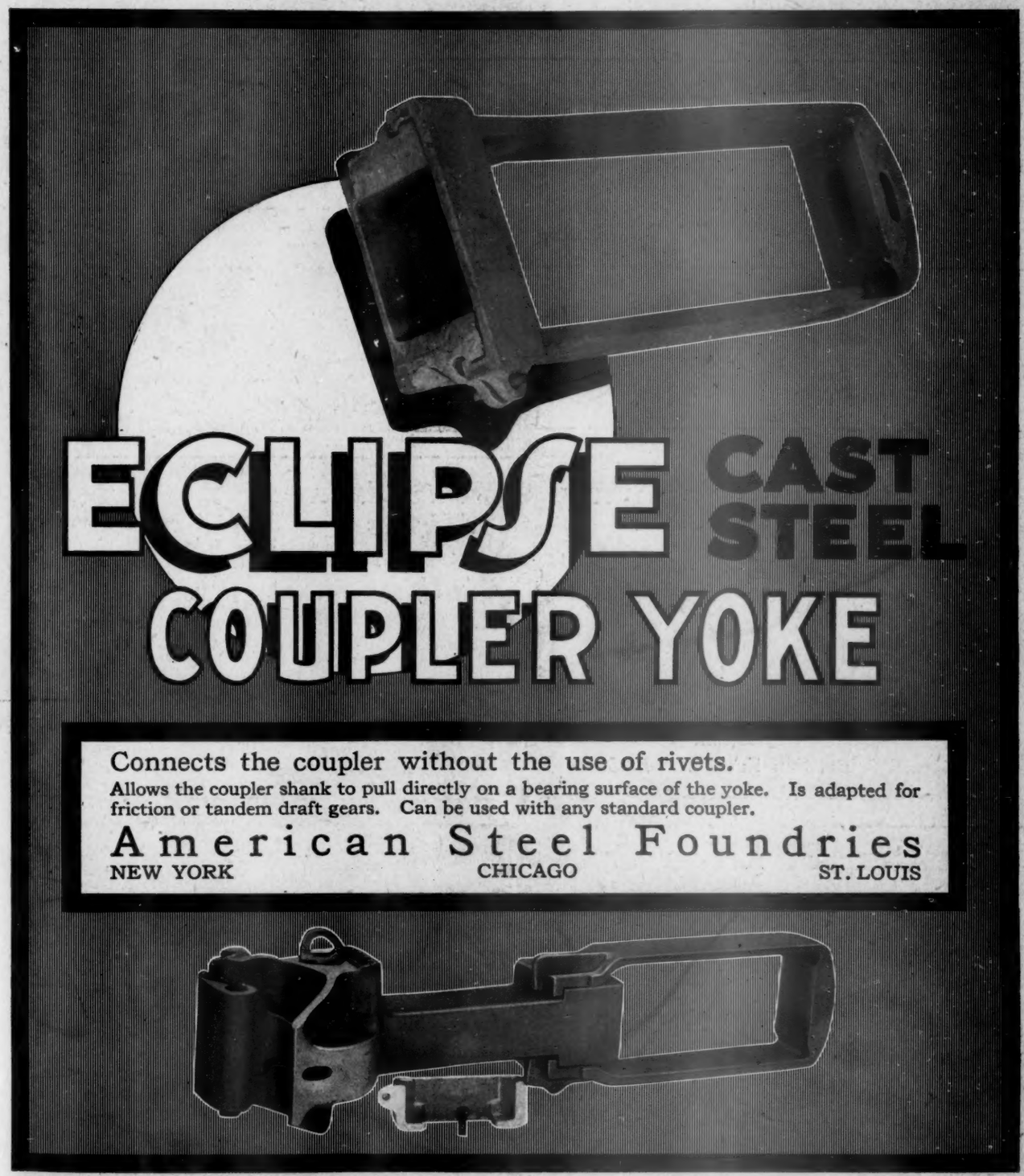
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Railway Age Gazette

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R. R. Y. M. C. A. Confronted with Big Task

One of the fundamentals of the Y. M. C. A. organization is that the work and responsibility should be put squarely up to the members and boards of management by the employed officers. Too often the members discharge their responsibilities lightly and the brunt of the work is left to an overworked secretary and his staff. An emergency confronts the Railroad Y. M. C. A. of this country that will demand the very best service of every one of its members during the coming weeks; and it is fortunate indeed that the membership campaign that was carried on a year ago resulted in such large accessions to the membership of the various associations. The wartime activities of the R. R. Y. M. C. A. look not only to the needs of soldiers who may be engaged in guarding railroad property and to rendering service to groups of soldiers who may be camped in railroad centers where such associations are in operation, but also to looking to the comfort and convenience of soldiers in transit. With the movement of the National Guard into concentration camps and the gathering together during September of 687,000 men into the various cantonments, the extent of this work will be so great that if every member does not do his full duty, splendid opportunities for service will be neglected. The Y. M. C. A. has earned the admiration of the world because of the remarkable service that it has rendered to the soldiers during the war, and the railroad branch should take pride in the faithful discharge of the important assignment that has been made to it.

Women Workers on Railways

The Times (London) recently published a communication from a neutral observer who had returned from Germany, referring to the use of women workers on the railways of that country. In speaking of a group of women who were working at a railway junction as mechanics he said: "I must say that these women compelled my respect, for they seemed burly and healthy and not unhappy at finding themselves in the positions they now occupy." In commenting on the future of the women workers, however, this statement was made: "There is already much complaint about the moral conduct of women workers. I am told that in Westphalia, where prisoners of war and women work together in the mines, the most deplorable condition of things prevails." These matters are particularly deserving of attention at this time when so many women are entering railway service in this country. If these workers are surrounded by proper conditions there would seem to be little danger of the lowering of moral standards. The Canadian railways have employed women for comparatively heavy work in railway shops with excellent results. Undoubtedly they profited by a study of conditions abroad. For instance, it is very noticeable that they insisted from the very start on strict and high standards of conduct on the part of both the male and female employees in their relations to each other and that exceptional care was taken to provide in advance adequate and convenient rest rooms for the use of the women. In practically all cases these are in charge of what might be termed shop matrons, who assume not only the care of the premises but act in the capacity of matrons in looking after and keeping in touch with the women workers. England's experience has indicated that in order to secure the best results from women workers in shops and factories special care must be taken to avoid overwork and the rest periods should be maintained that are customary in times of peace.

Increase the Efficiency of Cars and Locomotives

No clearer statement of the necessity for American railroads to conserve and make full use of their locomotives and freight equipment could be made than that by Daniel Willard, president of the Baltimore & Ohio, in an address before the officers of that railroad, which was printed in our last week's issue. He showed that France and Russia will require about half the output of the locomotive builders in this country, and what transportation facilities mean to Russia in the prosecution of the war. If these facilities are not provided Russia may be forced to conclude a separate peace, thus releasing over two million German troops from the Eastern front for use on the Western front, and requiring

just that many more American troops at the Western front. The problem resolves itself, therefore, into one that affects our national existence. Russia must have locomotives and equipment if it is to do its part in the war, and we in this country must sacrifice, work harder and use what we have with greater efficiency in order that this equipment may be furnished that country. While engineers are planning and devising means of combating the submarine menace our railroad engineers and designers must plan and devise means of making locomotives and cars do more work. The cars must be kept in good condition and when repairs are made they should be done thoroughly so that the equipment will not spend an excessive time on the repair tracks. There are a large number of locomotives that can be made to do more work by the application of devices which will increase their power and hauling capacity and they can all be made to do their work efficiently if properly maintained. The mechanics in the shops, the inspectors in the yard and the repairmen on the repair track may play as important a part in the prosecution of the war as the men in the trenches. Each one must realize this and do his part unselfishly. With only fifty per cent of the output of our locomotive plants available for domestic use and with demands for transportation which cannot be met, the men at our "shop line front" have become important factors in the situation and no stone should be left unturned to have them thoroughly understand the responsibility that rests on their shoulders.

CONSERVE THE COAL SUPPLY

THERE is a great deal of talk about the need for conserving the food supply of the United States. There has not been so much talk about conserving the coal supply, but there is probably even more pressing need for doing so. The situation with respect to the coal supply which has developed since the United States entered the great war has become alarming. Attention has been called to one phase of it by a memorandum on the movement of coal to Lake Erie ports for trans-shipment by water to Duluth which Howard Elliott, a member of the Railroad's War Board, has made public, showing that the amount of coal which has been transported to the head of the lakes for consumption in the Northwest this fall and winter is much less than it was last year. As a result of representations made on behalf of the railways the government has ordered priority given to coal shipments to Lake Erie ports. This, however, is only one phase of a serious situation to which government officers, the railways, the coal operators and miners and the public should give immediate attention.

The railways within the four months April, May, June and July, moved much more coal in the country as a whole than ever before in any corresponding period. In April, 1917, they handled 20 per cent more anthracite and 22 per cent more bituminous coal than they did in April, 1916. In May they handled 24 per cent more anthracite and 27 per cent more bituminous coal than in May of last year. In June they handled 18 per cent more anthracite and 29 per cent more bituminous coal than in June of last year. In July they handled 19 per cent more anthracite and 34 per cent more bituminous coal than in July of last year. In April, May, June and July, 1916, they moved 2,297,290 carloads of coal, or approximately 115,000,000 tons. In the same months of this year they moved 2,951,054 carloads, or about 148,000,000 tons, an increase for the entire period over the same period of last year of 28 per cent. When it is considered that the amount of coal moved in 1916 was the greatest up to that time—in other words, that the railways have this year beaten their best previous record by 28 per cent—it will be seen that if the coal situation is not satisfactory this is not because the railways have not been exerting themselves to the utmost to make it so.

What, then, is the cause of the trouble? There are several causes. Two of the most important are the following: First, before the war a large amount of coal was transported by vessels on the Great Lakes and in coastwise service which have since been transferred to other service, with the result that there has been a very large increase in the part of the burden of carrying the country's fuel supply which has been thrown upon the railroads. Second, there has been an enormous increase in the demand for coal for carrying on the country's industrial and military activities. Another fact, which has especially affected the situation in the Northwest, has been that navigation on the Great Lakes began three weeks later this year than in 1916. This, based on 1916 figures, affected the coal movement from Lake Erie ports to the head of the lakes to the extent of 926,000 tons.

What are the remedies for the situation? To make sure that the great Northwest, for which the amount of coal loaded into boats at Lake Erie ports was 2,507,000 tons less during the first six months of the year than it was during the first six months of last year, will be provided with an adequate supply, Mr. Elliott, for the Railroads' War Board, has suggested that the federal government make use of some of the extraordinary powers recently vested in it, and the government has taken action accordingly.

In order, however, that the supply shall be made adequate to the needs of the entire country it is desirable not only that the production and transportation of coal shall be increased, but also that in all ways that are reasonable its consumption shall be curtailed. The railways themselves already have made a good beginning in this direction. They have reduced their passenger service at the rate of 20,000,000 passenger-train miles a year and have other reductions in contemplation which will make the total reduction about 30,000,000 a year. It is estimated that this will effect a saving of about 2,000,000 tons of coal a year. The railways are the largest consumers of coal, and perhaps they should and will have to go still farther in curtailing their passenger service as a patriotic measure for the saving of fuel.

Why should not other industries "do their bit" along this line by eliminating all unnecessary use of coal? Why should not also every family do a part of its "bit" by refraining from using any more coal than is necessary? As deficient as is the coal supply of the United States, the fuel shortage in European countries is far more acute. In every country which has entered the war and in every neutral country of Europe one of the most serious troubles to which the war has given rise has been the almost insuperable difficulty of getting enough coal to keep the railways and industries running and to keep the people from freezing. The best way for the people of the United States to secure partial immunity from coal shortage is to conserve the coal supply. The railways can do and are doing much to reduce the consumption and increase the movement of coal, but there is a limit to what they can do.

MINIMUM WEIGHTS, WAR NEEDS AND PATRIOTISM

IN our issue for August 3 we published an editorial entitled "State Regulation Interferes with Railroad Efficiency." It was based chiefly on a letter written by E. P. Ripley, president of the Atchison, Topeka & Santa Fe, to the Chicago Tribune, in which he criticised the state railroad commissions in the Middle West for not permitting advances in the minimum carload weights on flour and other grain products to the basis allowed by the Interstate Commerce Commission—that is, 40,000 lb. In the present issue we publish a letter from Commissioner Dwight N. Lewis of the Iowa Railroad Commission, in which he criticises, not only Mr. Ripley's views on the subject of minimum carload weights, but also Mr. Ripley's attitude, or rather the attitude Mr. Lewis attributes to him, on railway regulation generally.

Mr. Ripley needs no defense from us, but we cannot let Mr. Lewis' criticism of him pass without saying that for many years he has stood forth as one of the ablest railway managers in the world, and that no railway manager in this country has been more public-spirited in operating his own railway or has done more to get railways generally operated in the interest of the public than he has. Furthermore, the charge that he has been "a most bitter opponent of railway regulation" is without foundation. He was one of the first among the heads of the large railways to recognize the fact that the Interstate Commerce Commission ought to be given the power to regulate rates, and, while he has been an opponent of certain kinds of regulation which have been especially prevalent in the Middle West, he has not been an opponent of regulation in itself.

Now, as to the specific subject discussed by Mr. Ripley and Mr. Lewis. It is well known—or ought to be well known—that the railways, owing to past unwise regulation and to conditions created by the war, are confronted by a traffic which has exceeded their capacity and which will soon be so large that they will be unable to handle it all unless they are able to move the maximum possible amount of freight with every freight locomotive and every freight car. In recognition of this fact, the railways, under the leadership of the Railroads' War Board, have been carrying on a nation-wide campaign to secure the maximum loading of cars and their prompt loading and unloading. A large part of the shippers of the country have responded to the appeals of the railways and are vigorously co-operating with them, but there are many shippers who are not doing so and who apparently will not do so unless they are forced to. The only way to force them to load heavier is to increase minimum carload weights.

Mr. Lewis, in his letter, refers to the opinion of the Iowa Railroad Commission rendered on July 23, 1917, in which the commission refused to permit an increase of the minimum carload weight on flour from 24,000 lb. to 40,000 lb. It was a matter of record in this case that the Interstate Commerce Commission had allowed a minimum weight of 40,000 lb. to be fixed on interstate shipments. It was also a matter of record, to quote from the opinion, that "there are practically no cars in active service on any of the larger systems of railways operating in Iowa of a capacity of less than 30,000 lb., and there are very few of less than 40,000 lb. to 80,000 lb. capacity." The commission found, however, that "the average local dealer in flour and other mill stuffs in the towns and villages of Iowa is running his business upon a very small capital, making it financially impossible for him to purchase a 40,000-lb. car of flour at the present abnormally high prices, also at the prices obtaining prior to the present application for an increase in the minimum weight; that a great many of said local dealers cannot now use the 24,000-lb. minimum except that a portion of a car may be made up of feed and other mill products." The commission decided that it would not allow an increase in the minimum because "we do not believe we would be justified in taking any action that would result in financial disaster to the mills now operating in Iowa, even though they are small and of limited capacity." It was shown that the larger shippers would not object to, but would even welcome, an increase in the minimum weight.

Commenting upon Mr. Ripley's criticism of the state commissions, Mr. Lewis says: "Because state railroad commissions are undertaking to save to the small shipper and to the consumer somewhat upon the cost of his living or the conduct of his business is no reason why such state commissioners should be considered less patriotic during this war period than the president of a railroad who, in the face of greatly increased earnings, insists upon higher rates and greater minimums. Working for his company, Mr. Ripley overlooks the fact that a railroad company is performing a public service and that there are times when the public interest must be placed even above private ownership and large dividends."

These statements, coming from such a source, seem to express a want of understanding of the present railway situation that is little less than appalling. Mr. Ripley did not, in his letter from which we quote, argue in favor of an increase in minimum weights because it would tend to augment the earnings or reduce the expenses of his railroad. He did it upon the ground that the amount of traffic handled per car must be increased as a means of helping the nation in the present struggle. If the greatest possible utilization of railway equipment is not secured the railways will not be able to handle the country's business, and if they cannot handle the country's business the nation will be seriously hampered carrying on the war.

Mr. Lewis reminds Mr. Ripley that there are times "when the public interest must be placed even above private ownership and large dividends." True. But Mr. Lewis apparently overlooks the further fact that the welfare of the people of the United States must sometimes be put above the convenience and profits of a few small dealers in flour and mill stuffs in the state of Iowa. As a matter of fact, the railways in their efforts to secure the greatest utilization of equipment are trying to promote the interest, not only of the public in general, but also of the very shippers of flour and mill products in Iowa that the railroad commission of that state thinks it is protecting. If the railways do not secure the greatest utilization of equipment there will not be enough cars to go around, and, in consequence, these very dealers in flour and mill products in Iowa will not have enough cars in which to ship their commodities in carloads of 24,000 lb. or any other size.

It is a notable fact that the decision of the Iowa Railroad Commission denying an increase of minimum weights was rendered on July 23, 1917. This was over three months after the entrance of the United States into the great war. In other words, after three months of war, after three months of military preparation, after three months of explanation of the railway situation and of the reasons why it is what it is, it is still possible for the railroad commission of a great state to believe that it is acting in the "public interest" when it throws obstacles in the way of the railways in their efforts to secure the greatest efficiency in their operations.

Apparently, however, Mr. Lewis does not believe that increases in carloading are in the interest of efficiency. He says: "I recently talked with one of the high traffic officials of one of our western railroads and he stated as his opinion after several years' careful observation that the railroad companies, in their mad desire for larger cars, heavier locomotives and long trains, had become less efficient in the expeditious and economic handling of the traffic of the country." Either the "high traffic official," who expressed this opinion—whoever he may be—does not know the A B C of railway operating efficiency, or all the railway executives from James J. Hill down, who have made notable records in increasing operating efficiency have proceeded along wrong lines. If railway rates had been regulated as they have been by the Iowa and other commissions, and at the same time the great and to the promotion of the welfare, not of localities or of increases in carloads and trainloads had not occurred, every railway in the United States would have been bankrupt long before this. It is big carloads and trainloads that have made possible the present high wages and low rates. What is more important at this critical juncture, without the great increases in carloads and trainloads which have occurred the railroads could not possibly handle their present traffic with present facilities, and without still further great increases in carloads and trainloads within the next few months they will not be able to handle the vast additional traffic which will be offered to them.

By subordinating the efficiency of the railways, in this terrible crisis, to the supposed interests of a few of their local

constituents, the state railroad commissions of the Middle West are using their authority to help autocracy in the struggle against democracy, to aid the Kaiser to whip Uncle Sam. If that is not putting local selfishness, or politics, or something equally reprehensible above patriotism, we do not know how to describe it. The railway managements, by voluntarily subordinating the interests of their individual lines to the securing of the maximum efficiency of all lines states, but of the nation as a whole, are setting an example of disinterestedness and patriotism which many public officials seem unable to understand, much less to emulate.

NEW BOOKS

The Life of James J. Hill. By Joseph Gilpin Pyle. Two volumes. 958 pages, 8 illustrations, 6½ in. x 9½ in. Bound in cloth. Published by Doubleday, Page & Co., Garden City, N. Y.

A true estimate of the life of a great man cannot be conveyed through the medium of ornate and abstract eulogy. Fully cognizant of this fact, the author has recounted Mr. Hill's achievements in the many fields of activity which drew his attention, at the same time indicating the scope of his work, the catholicity of his interests and the genius he applied to every undertaking. The biography impresses the reader not only with the unremitting energy, rare foresight and consummate ability of the great railroad builder but with the fact that these qualities were translated into constructive results. Indeed, Mr. Hill was a great general of peace who mobilized large forces of men, materials and capital for the conquest of an empire from the wilderness. In fact, the history of the Northwest is in no small measure a chronicle of the work of James J. Hill.

How he first engaged in the transportation business when the rivers were the commercial highways of the Northwest, how he acquired the St. Paul & Pacific when it was nothing but two streaks of rust, extended it to Winnipeg and later by gradual stages to the Pacific coast, is related in detail. His important connection with the construction of the Canadian Pacific, his acquisition of the control of the Northern Pacific and the Chicago, Burlington & Quincy, the Northern Securities case, the crucial struggle with Harriman, and the Minnesota Rate Case are high points in his life to which a considerable portion of the biography is devoted.

Throughout his career, Mr. Hill displayed the qualities of an astute and sound economist. He thoroughly understood the relation between natural resources and transportation, and realized how necessary it was to foster the development of the agricultural, lumbering and mining industries in order to create railway traffic. He was foremost in introducing higher grades of seed, mixed farming, fertilization and improved farming methods in the Northwest. He was a pioneer in the conservation movement. Throughout his business career he showed a keen conception of sound financing and efficient management. Not a dollar of the capital of the Great Northern represents what is commonly termed "water." A few years before Mr. Hill's death he thoroughly reorganized the road's finances to insure it against all contingencies for half a century to come. He was often called upon to lend his assistance to corporations in which he had little or no interest. In this way he helped the Erie and the Baltimore & Ohio to shake off financial difficulties. Shortly before his death he established a great bank at St. Paul to emancipate the Northwest from dependence on Wall street during the crop moving season. In 1907, Mr. Hill saved thousands from financial ruin as well as privation by extending credit to farmers when banks generally had practically suspended operations.

He had an excellent grasp of issues confronting the country and was in constant demand as a speaker. When "trust busting" was the popular thing he summed up the real abuses of industrial combinations and their cure in an address before the Illinois Manufacturers' Association. He said in part: "The valid objection to many concerns, especially some of those known as 'industrials,' is that they appear to have been created in the first place not so much for the purpose of manufacturing any particular commodity as for selling sheaves of printed securities which represent nothing more than the good will and prospective profits of the promoters. . . . Under the constitutional provision allowing Congress to regulate commerce between states, any company desiring to transact business outside of the state in which it is incorporated should be held to a uniform provision of federal law; namely, that all should satisfy a commission that their capital stock was actually paid up in cash or in property taken at a fair valuation, just as the capital of a national bank must be certified to be paid by the controller of the currency." The mere size of a corporation does not constitute a danger, he said, and may often result in distinct benefits to the workingman, consumer and capitalist in the shape of higher wages, lower prices and safer and more productive investments.

Mr. Hill was one of the first railroad men to realize the extent to which railroad development had been arrested by repressive legislation and regulation. In an address before the Merchants' Club in Chicago in 1906 he declared it the most important question confronting the country since the Civil War. In a letter to Governor Johnson of Minnesota in 1907, he pointed out the great disparity between the growth of traffic and the additions to railroad mileage and equipment. He showed that in the 10 years from 1895 to 1905 the total single track mileage of the country had increased but 21 per cent, locomotives 35 per cent, passenger cars 23 per cent and freight cars 45 per cent. In the same time passenger mileage increased 95 per cent and freight ton mileage 118 per cent. Improved facilities necessary to take care of the traffic of the country could only be built with more money, and more money could be obtained only if the railroads were permitted to earn the profits accruing from other forms of investment.

Mr. Hill was an individualist. He believed the functions of our national economy could be more efficiently discharged through private initiative than through government ownership or control. Government ownership of railroads, he maintained, would mean the death knell of democracy. An administration backed by the votes of 2,000,000 transportation employees would have unassailable power.

Proceedings of the American Railway Engineering Association. 1721 pages, illustrated, 6 in. by 9 in. Bound in half morocco, cloth or paper. Published by the American Railway Engineering Association, Karpen Bldg., Chicago. Price, half morocco, $7; cloth, $6.50; paper, $6.

This is the largest volume of proceedings ever published by this association under one cover. The proceedings of 1911, published in three volumes, contain a few more pages. Of the total contents of the volume for 1917, 1,438 pages are devoted to committee reports, 141 to discussions on the floor of the convention and 142 to special papers and monographs. Following the general rule, the committee on rail presented the longest report which includes an extensive report on the quick bend test of rails as a substitute for the drop test, a paper on induced interior transverse fissures, and an account of tests of rail joints. The report on electricity comprises 182 pages, of which 152 are devoted to a preliminary report of the American Committee on Electrolysis. The Committee on Records and Accounts submitted a large number of forms for field and office use in valuation. Service records of cross ties occupied a considerable portion of the report of the committee on wood preservation. The miscellaneous papers included the full final report of the Joint Committee on Concrete and Reinforced Concrete, occupying 63 pages; a study of fuel consumption calculations; the electric power input on movable railroad bridges; and a reprint of a paper on the cost of railroad transportation, prepared in 1874 by Albert Fink.

Letters to the Editor

TWO ANSWERS TO "INITIATIVE—ORGANIZATION AND EDUCATION"

DETROIT, Mich.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I am not in sympathy with the letter entitled "Initiative—Organization and Education" and signed by "Observer" published in your issue of August 10. Railroads of today are handled by rule. It is not expected of a junior officer to do what he knows to be good railroading, without the sanction of his superior officer, if the action is in conflict with the approved practice or system. It would not be possible to have system if junior officers were permitted to use their judgment in conflict with the general policy. Such a method, by which the judgment of inexperienced officers (as junior officers are usually), would result in chaos. It is only in recent years that railroads have become cognizant of this fact and have profited through efficiency measures and system.

What the writer says about nepotism might have been true under the old method of railroading, but it is not true today. With reference to the general superintendent who, over the heads of the superintendent, trainmaster and yardmaster, dismissed a couple of his engine foremen from one of his yards,—this might happen in one case out of a hundred. As to assigning to an agent authority to put on and take off help ad libitum this, in my judgment, would be unwise.

The greatest problem confronting railroad officers of today is to educate the old employees, rather than the new ones, into new methods. Safety in transportation is the first essential. If officers and employees make it their business to observe carefully the rules and regulations and devote their energies toward expediting the company's business along these lines, they will have done all that should be expected of them.

I consider this presentation unwise and harmful to young railroad men and junior officers. The facts are that it would not be possible for an officer of a railroad, under the old method, to "reach first base" today.

FRANK H. ALFRED,
President, Pere Marquette Railroad.

MONTREAL.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read Observer's letter on "Initiative-Organization and Education," in the August 10 issue, and I would like to say to Observer, "Well done."

I do not believe he is the kind of man who will worry over what a few self-sufficient, all-sufficient men in the railway service will say about his letter and his views generally. These are the men who should read this letter many times, but unfortunately they won't. Men who practice the methods he condemns will not learn, but that is not Observer's fault. He could have gone further than he has in pointing out how the initiative is destroyed, for he has failed to mention the cases where the favorite is given the credit and money due to the man who has but his work to recommend him.

There is also the official whose personal office staff can do no wrong and who never learns the great harm these lick-spittles are doing his railway. Here is a case I have personal knowledge of, I know both the man and one or two of his clerks. The man was a district freight agent with a large number of local agents reporting to him. He would find that an agent was not following out instructions as per circular No. 00, and would call on his staff to show that the agent had received the circular. They found that through their neglect the circular had not been sent to the agent. Knowing the man they had to deal with they simply forged a receipt of acknowledgement for the circular and handed it in. The agent, or perhaps a number of agents, would then receive one of those "stingers" for which the "old man" was noted. What a loyal lot of fellows they would be for the next six months, and by that time there would be more of the same thing from the same source. These men in the mass are more important to the railway than the district agent, and individually better men than the members of his office staff.

I say again, well done Observer, let us hear from you again, and while on the subject take a look at other lines of business to see if by any chance they are all free of the evils mentioned. It is poor human nature that Observer is gunning for. Why train his "75" on the poor railway? Try a shot at the other fellows and see what you bring down.

ANOTHER OBSERVER.

COMMISSIONER LEWIS REPLIES TO MR. RIPLEY

DES MOINES, Ia.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have long been a reader of your magazine and have always regarded it as one of the strongest, if not the strongest, railway magazine we have. Perhaps because I have always so highly regarded it, is the reason I now desire to take exception to a recent editorial.

In your issue of August 3, on page 176, is an editorial comment on the various minimum weights applying on flour and other mill products in carloads, as promulgated by a number of states therein named.

E. P. Ripley, president of the Atchison, Topeka & Santa Fe railway, whom you quote, has been a most bitter opponent of railway regulation. He is a good controversialist, and were it not for his persistent "anti" attitude his ability and long years of experience should give his opinion much weight with every one. It is true with him, however, as it is always true with those whose prejudices are permitted to color their argument, that his statements will not always bear close and careful scrutiny.

It is no argument for Mr. Ripley to cast aspersion upon the character of men who may be members of state commissions, however true his accusations might be, if those commissions, in the performance of their duties, have rendered decisions or made orders in accordance with the evidence submitted. Your editorial is occasioned by the action of the Kansas Commission in refusing to advance the minimum on flour beyond the 24,000 lb. limit, yet your comments are general. This Commission, too, has but recently declined to grant an increase in the minimum on flour, and it remains at 24,000 lb.

I do not desire to enter into any controversy with Mr. Ripley. If he believes he is best serving the public and the interests of his company by slandering state railroad commissions and continually objecting to regulation, then I leave the field to him. I do not, however, like to see so good a paper as yours accept the unsupported statements of Mr. Ripley as a basis for an assault upon state railway regulation. It may be you are right and that state regulation should be abolished; however, this will never be done upon anything Mr. Ripley may ever say upon the subject.

I but recently talked with one of the high traffic officials of one of our western railroads, and he stated as his opinion, after several years' careful observation, that the railroad companies, in their mad desire for larger cars, heavier locomotives and long trains, had become less efficient in the expeditious and economical handling of the traffic of the

country; that shorter trains, more frequent service and less insistence on enormous carloads, would move the traffic faster, cheaper and more satisfactorily. Of course, he did not mean going back to the small and inefficient cars or locomotives, but what he meant was, that loading and service should be based more largely upon the commercial needs of the country, rather than upon the possible ability of a carrier to handle immense trains and heavier carloads.

I note by the press despatches today the railroads of the United States have increased their net earnings in June, 1917, eight million dollars more than the figures show for June in 1916. Of course, you will remember 1916 was the best year the railroads ever had. The carriers are to be congratulated upon their splendid showing. But, because state railroad commissioners are undertaking to save to the small shipper and to the consumer somewhat upon the cost of his living or the conduct of his business, is no reason why such state commissioners should be considered less patriotic during this war period than the president of a railroad who, in the face of greatly increased earnings, insists upon higher rates and greater minimums. Working for his company, Mr. Ripley overlooks the fact that a railroad company is performing a public service, and that there are times when the public interest must be placed even above private ownership and large dividends.

I am enclosing you a copy of our decision in the minimum weight case. I ask as a favor that you read this opinion, as it not only gives our conclusions, but the evidence upon which such conclusions are based.

DWIGHT N. LEWIS,
Member, Iowa Railroad Commission.

GOVERNMENT OWNERSHIP AND RAILWAY RATES

TARRYTOWN, N. Y.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The New Republic, in an editorial on government ownership of railways appearing some time ago, advocated the theory that it is impossible for the public and the government to co-operate sympathetically with the railroad managers, and that the failure of railroad credit will eventually force the issue. While the recent rate decision seems to give point to such a belief, there is the possibility of a complete reversal of attitude by the Interstate Commerce Commission after the appointment of three new members. Moreover, the intimate relations that are now being developed between the government and the railroads through the railroads' War Board should surely aid in bridging the chasm.

The New Republic's latest editorial in the issue of July 21, however, evolves the unique principle that rate-fixing, being inherently a form of taxation, is therefore easily adapted to exploitation by governmental agency for the purpose of stabilizing the operation of the whole industrial and financial system.

Such a theory has little of value, but the very novelty of the argument makes it of interest. It is said that rates based on what the traffic will bear include "a charge for service and an additional charge that is essentially . . . one of the least burdensome forms of taxation, resting mainly upon unearned increment." The idea of unearned increment cannot in any true sense be applied to railway traffic as a whole, probably not to more than a small portion of the traffic. Of course, it is true that half or more of the tonnage of the average road consists of coal, lumber, etc.—commodities subject to monopoly at the source. But it is also true, I believe, that the railroad rate, though it may in a sense be called a tax, is borne more largely by the consumer than by the producer. It is easily shifted except in cases where relocalization of industry is possible.

It is not true that the average rate now consists of "a charge for service and an additional charge that is essentially of the nature of taxation." Our whole rate system is honeycombed with inconsistencies—in fact, there is no system worthy of the name. There is no "charge for service" in the sense of a cost basis. The railroads do not know what the traffic costs to handle. When the Commission fully understands the scope of its duty it will, perhaps, inaugurate a national rate system based on the cost principle rather than the tax idea—with regard, however, to the present distribution of manufacturing. Our greatest industry would then be placed on a basis of efficient relation to other industries; but such a step will require many years to develop, and there is danger in too rapid a change from present bases.

The problem of cyclic changes—periodic booms and depressions—would not be solved, as the New Republic hopes, by a system whereby railroad rates would be placed on a sliding scale. This involves the assumption that the government should become a general clearinghouse of industry, which is hardly tenable except under war conditions or a socialistic regime. The issue of prosperity vs. depression is purely a problem of credit and finance (subject of course, to political and international factors), and must be regulated as such. Moreover, an attempt at control through exploitation of railroad rates would merely thrust us on another horn of our national dilemma—the high cost of living.

The idea of using the railroad rate in a dual function of "diverting to the public treasury part of the excess profits of boom times" and of "abating the evils of speculation and unmerited enrichment" is, indeed, too fanciful for serious consideration, and deserves attention only because it appears in a journal said to be the best exponent of modern politico-economic conditions. Taxation must be based on simple principles and applied at the source; and there are many ways of despoiling monopoly of its ill-gotten gains, if we will only courageously adopt them. To use the rate-tax principle would not only befog the issue as to the fair distribution of wealth, but would deprive industry of its only stable and dependable set of values.

The welfare of the railroads themselves must always be considered as the paramount issue. Of course, if rates are to remain stationary without respect to a steady decline in the purchasing power of the dollar, the government must ultimately (and perhaps not far in the future) use its superior credit to finance the needs of the railroads; but that does not necessarily imply government ownership, although it may be considered an unwise and dangerous step toward the adoption of that policy.

OWEN ELY.

HALF PORTIONS ON DINING CARS

INDIANAPOLIS, Ind.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

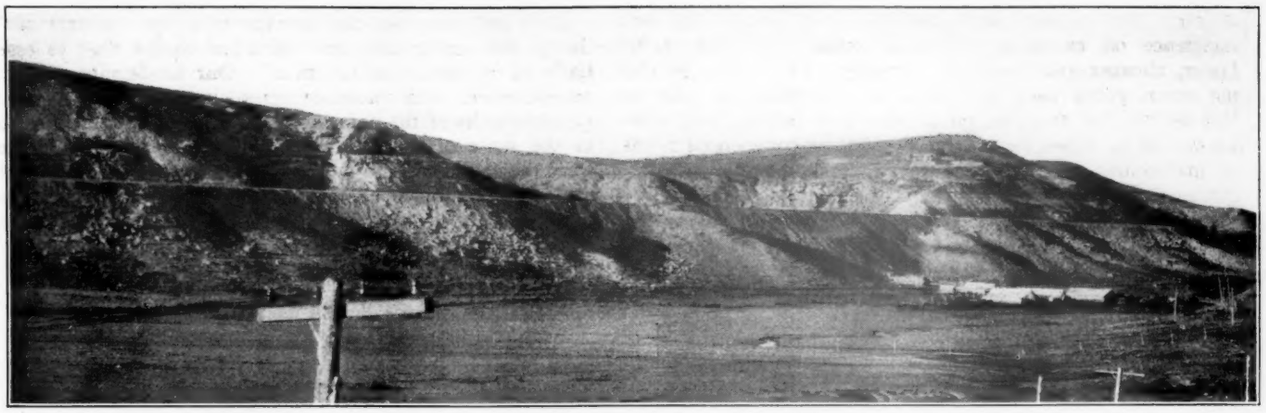
I notice in your publication of July 13 reference to the relative merits of a la carte and table d'hote.

I have wondered many times, since war began and prices commenced to go up, why a similar arrangement did not work on dining cars as obtains in many of the restaurants where a la carte obtains and half portions are served so that parties can order according to their appetite.

Thus: If a whole portion of ham and eggs a la carte is 75 cents, would it not be economical to serve a half portion of ham and one egg at say 40 or 45 cents; one whole order of French fried potatoes, 25 cents and half portion, 15 cents.

Many times, while eating on the diners, a large portion of my dinner has gone back to the kitchen on account of the portions being too large.

FREQUENT TRAVELER.



New Line Along the North Side of the Canyon East of Castle Rock

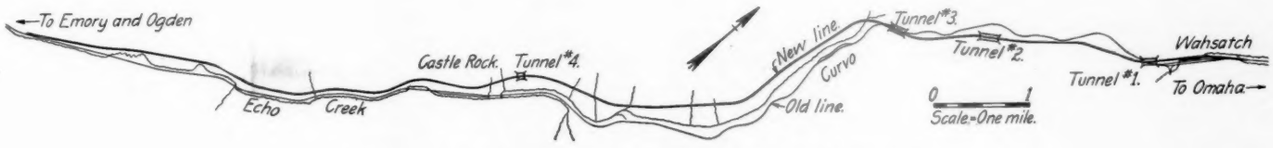
Second Track Work on the Union Pacific

Heavy Grade Revision Was Made in Connection with the Improvement of a Dense Traffic Line in Eastern Utah

THE Union Pacific is now completing the construction of a section of second track in eastern Utah which is of unusual interest because of the difficult problems presented. This work comprises the last 16 miles of the 75-mile climb east from Ogden to the crossing of the Wahsatch mountains The construction work is very heavy, involving an expenditure of more than $3,000,000, or nearly $200,000 per mile, and was undertaken primarily because of the congestion resulting from the heavy traffic and the pusher engine movements down the hill.

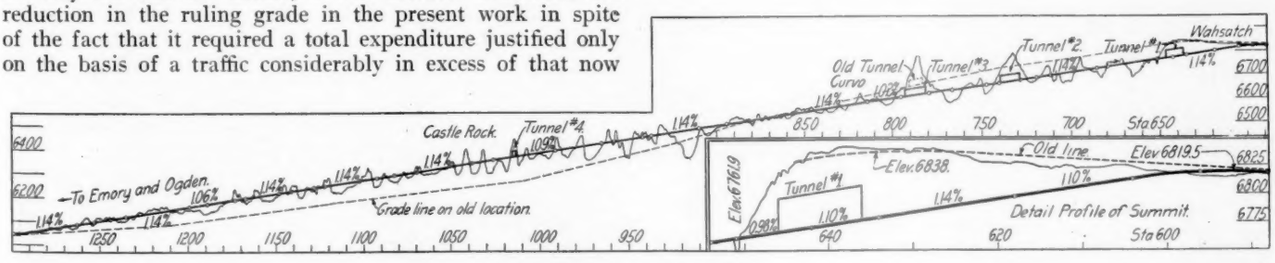
Since the character of the country is such that the construction of a second track on the present location would commit the railway to so large an investment that subsequent grade revision or other improvement would necessarily be set very far into the future, it was decided to include the reduction in the ruling grade in the present work in spite of the fact that it required a total expenditure justified only on the basis of a traffic considerably in excess of that now handled. The maximum grade on this section is being reduced from 1.77 per cent to 1.14 per cent compensated, this being one of only two places on the Union Pacific between Omaha and Ogden where a maximum gradient of 0.82 per cent has been found impracticable. The other place is between Cheyenne, Wyo., and Buford.

The traffic on this portion of the Union Pacific has been growing rapidly during the last few years and was unusually heavy during the last year, averaging 12,500 gross tons westbound and 13,500 tons eastbound daily for combined freight and passenger movement. However, in the fall of 1916 a maximum daily movement of 26,000 tons eastbound and 11,000 tons westbound was handled. This eastbound movement required 17 trains and the westbound 8 loaded trains, 5 light extras and 21 light engine movements. In addition to this there were 6 passenger trains in each direction.



Location of the Old and New Lines in the Echo Canyon

The new work involves the portion of the line between Emory, Utah, and Wahsatch, where the old line was located up the Echo Creek canyon in 1864 by Samuel B. Reed. The existing line occupies the original location and will continue in operation under the new plan as the westbound or down-hill track, the new line being constructed as a single track line for ascending trains. The old track is located very largely on the south side of the canyon and the location is such that considerably less than half of the climb from Emory to Wahsatch is made in the first half of the distance between those places. Thus the maximum gradient between Emory and Castle Rock, located about half way, is only



Profile of the New Line

1.11 per cent, while the climb for the remaining distance necessitates a maximum grade of 1.77 per cent.

The new track is parallel to and 14 ft. north of the old one for the first 2½ miles east of Emory, but for the remaining distance it is on an independent location along the north side of the canyon, where it was possible to obtain support in the vicinity of Castle Rock at a sufficient elevation to secure a grade of 1.14 per cent compensated for the entire distance. The location along the north side of the canyon was also governed partially by the fact that this side receives much more sunlight and is therefore less subject to disadvantageous winter conditions.

The new line is an improvement over the old one in other respects than grades. It is 0.342 miles shorter, the curvature is less by 757 deg., and the total length of curves is 5.7 miles as compared with 7.65 miles on the old line. The maximum curve is 3 deg. as compared to 6 deg. The reduction in rise and fall is small, only 17.48 ft.

As seen on the profile, the situation at the summit is rather unusual. The physical features of the saddle in the mountains at Wahsatch are such that no material reduction in the elevation of the tracks could be accomplished. The improvement in the grade line was secured partially by moving the summit on the new tracks about 3,800 ft. east of that for the old one. Here the two tracks are practically at grade and while the old line remains on the surface for

The Summit Cut—Old Line on the Surface to the Right

almost a mile to the west, the new line descends into a cut which has a maximum depth of 65 ft. at the lower end where it terminates in a tunnel 1,500 ft. long. This tunnel has a maximum over burden of only 35 ft. and is crossed by the old line in a cut about 5 ft. deep.

The grading of the new line is largely in the nature of side hill cuts through cliffs, containing a variety of materials varying from hard sandstone to shale with relatively short high fills in the ravines between. Some of the cuts, particularly in the vicinity of Castle Rock and further west, are over 100 ft. deep, although they contain relatively small quantities of material. One exception to this is an embankment between Castle Rock and Curvo, which is 113 ft. high and contains nearly 1,000,000 cu. yd. of material in a length of less than 1,000 ft. Another exception is the summit cut referred to previously which required the removal of 275,000 cu. yd. of material. There are four tunnels, the longest being tunnel No. 1 near the summit and they form an interesting feature of the project.

Embankment Work

Owing to the fact that the bottoms of the ravines contain earth that could be handled economically while the cuts were largely in rock, the grade line was established with a considerable excess of material in the embankments so that, in general, material borrowed from the bottoms was used very largely in the bases of the embankments and the material from the cuts was used principally for the upper portions of the fills. In some cases the embankments were made almost entirely from borrow, one of 175,000 cu. yd. near Castle Rock taking only 25,000 cu. yd. from adjoining cuts. In nearly all cases the borrowed material was taken out with Fresno graders working over relatively large areas

Typical Embankment Work

with limited depths of pits. This work followed common practice as a rule, but in one or two cases wagons were used having a capacity of 4 cu. yd. The team outfits were an important factor in the work on this project and a number of good records were made. In one fill of 125,000 cu. yd. west of Tunnel No. 1, a record of 1,200 cu. yd. in 10 hours was made with one grader hauled by 16 horses and served by 12 two-horse wagons.

One advantage gained by borrowing a large part of the

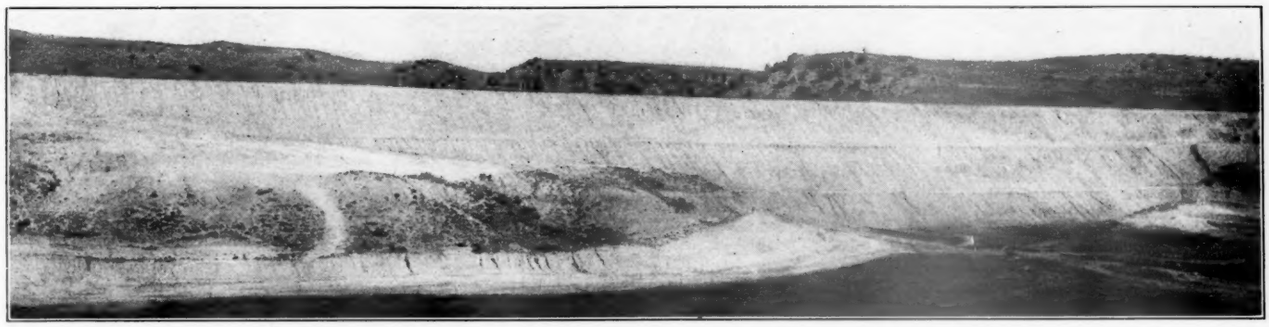
125-ft. Cut—"Daylighted"

material in the hills from pits in the bottom was that the making of the lower lifts by teams reduced the height of trestle required for unloading the material coming from the cuts. Part of one side hill embankment was made by a steam shovel casting directly while excavating the roadway necessary for it to reach the required elevation for the first cut. The material in the fills is of a character that will

not roll to a 1½ to a 1 slope from a trestle or over the edge of the embankment but will gradually assume that slope through the action of wind and frost. On this account the contractors were not compelled to produce a fill of standard dimensions, but the top width was made sufficient to insure a full section after natural agencies had become effective. A shrinkage allowance was made only in the width of the roadbed, the embankment being allowed to stand over the winter and the grade then restored for any settlement by raising it in the spring.

The largest single feature in the earth work was the building of the 1,000,000 cu. yd. embankment near Curvo. to a considerable extent because there was a marked variation in the character of the material encountered in close proximity.

The side hill cuts were daylighted whenever this could be done with the removal of not over 10,000 cu. yd. of additional material. The contractors were required to trim the slopes to the neat section and were cautioned particularly to avoid over-cutting. This was done to eliminate irregularities that would eventually lead to slides, washes or rock falls. Other special measures were also taken to overcome this last danger. One of the illustrations shows a cut having a face 125 ft. high that was provided with a bench 15 ft. wide

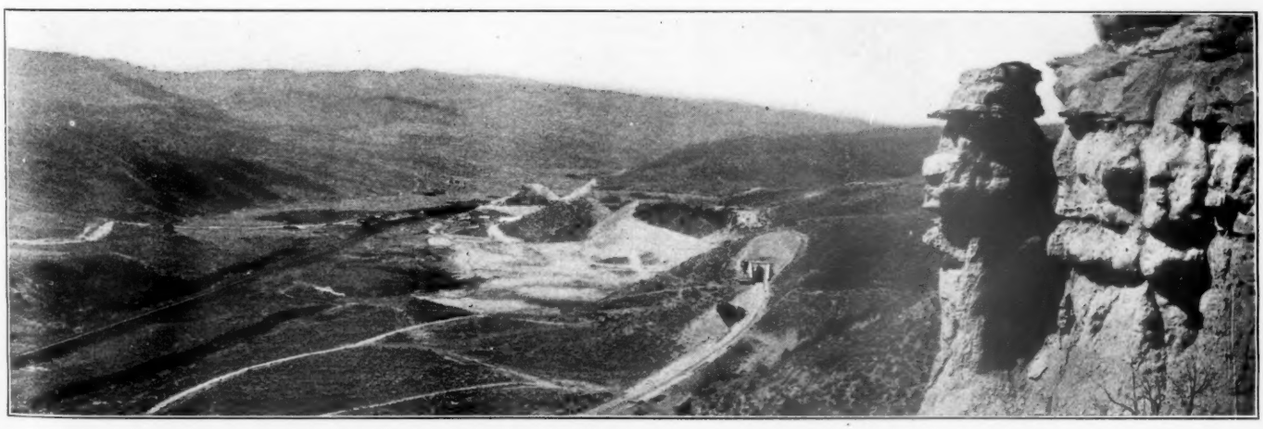


The Large Fill Near Curvo

This is nearly 500 ft. wide at the bottom and was made in three lifts, the first of 30 ft. or more and the second and third of 42 ft. each. Twenty-foot berms were provided between the lifts on each side. Three steam shovels were employed for a part of the time to make this embankment, but the program of the work as carried out was equivalent to the continual performance of the two 70-C Bucyrus shovels from April 20 to November 18, working two 10-hour shifts daily. In addition to the work done by the shovels a total of 100,000 cu. yd. was placed by two Fresno grading outfits working partially on the bottom lift but principally on the

40 ft. above grade, in addition to which the slope was carefully cleaned by hand while the lower portion was scraped by the steam shovel to remove all loose rock. The daylighting of this cut produced a shelf 90 ft. wide. The slopes of all cuts were made 1 to 1.

The summit cut contained 275,000 cu. yd. principally of rock, although 5 ft. of black soil was encountered near the upper end. Most of the material was wasted. As this cut was arranged to drain through the tunnel at its lower end and as excavation was in progress long before the tunnel was completed, it was necessary to install pumps to remove



The New (Right) and Old (Left) Tracks Near Castle Rock

west end of the top lift. The material for this team work was secured close at hand but it was necessary to go a mile from the fill to secure borrow pits containing suitable material in adequate quantities for the shovels. The shovels were served by 4-yd. dump cars handled in 12-car trains by 20-ton locomotives on 3-ft. gage track.

Interesting Excavation Methods

The excavation in the cuts was troublesome because of the difficulty experienced in drilling and shooting the harder classes of rock encountered. The work was also hampered the water during construction. Notwithstanding this the steam shovels mired badly and resort was had to a drag line excavator working from the top of the slope. This machine was employed successfully to load 30,000 cu. yd. into 4-yd. dump cars that were used to haul the material away.

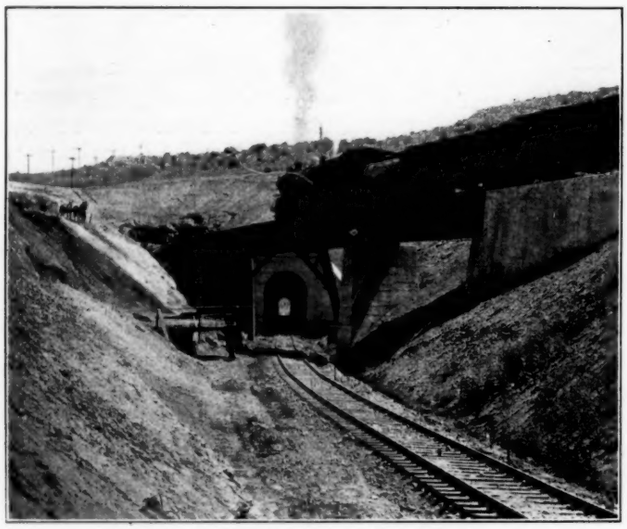
Tunnel Work

Tunnel No. 1 was driven through material of a character that required immediate timbering. Consequently a top heading was adopted, with a cross section that permitted

the erection of the full arch at once, down to the level of the wall plates on either side. Following the placing of this timbering, the benches were shot down and the muck from both the heading and the bench were loaded by an air-operated shovel into small cars handled by gasolene locomotives.

Jack hammers were employed throughout, using 16 holes 8 ft. deep in the heading which removed about 6 or 7 ft. of face to the shot. In some of the soft material it was possible to use augers in place of drill bits. Air for the tunneling operations was supplied by a plant containing three two-stage steam air compressors having a combined capacity of 1,440 cu. ft. of free air per minute to 100 lb. per sq. in., steam being supplied by four 100-hp. boilers.

Tunnel No. 2, which is 1,100 ft. long, pierces rock of sufficient stability to make a lining unnecessary at the start, but as the rock disintegrates on exposure the tunnel will be lined with concrete. As a measure of temporary safety a set of posts and segments were installed every 8 ft. The tunnel was driven with a bottom center heading 10 ft. wide by 12 ft. high with the bottom 4 ft. above subgrade. This was advanced by 25-ft. holes in the face, drilled with jack hammers with a crew of 10 men—two drillers, four muckers and four mule drivers—the average progress being about 17

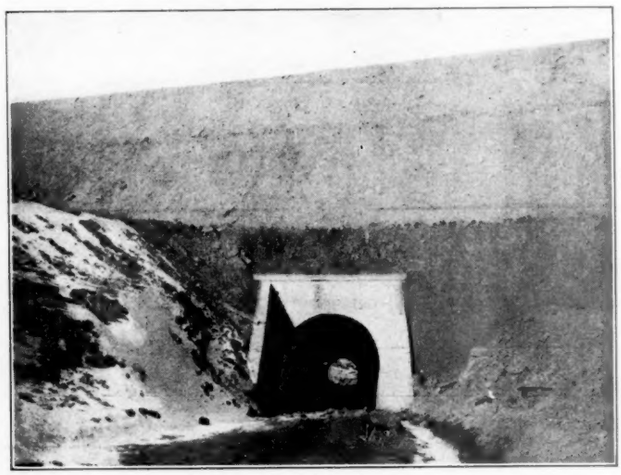


New Line Crossing Under Old at Tunnel No. 2

ft. per day. The enlargement was made by drilling 20 radial holes at intervals of 5 ft. along the tunnel, the 7 upper ones being drilled by a stope drill and the 13 lower ones with jack hammers. The bottom holes, which were drilled 6 in. below subgrade, were shot first about 75 ft. ahead of the upper holes, from 2 to 4 rings being shot at one time. The muck from the enlargement was taken out with an air-operated steam shovel that averaged about 20 ft. of advance per day. The air used in the tunnel work was supplied by a plant which also furnished air to the work on tunnel No. 3 only about a mile distant.

A peculiar situation obtains at tunnel No. 3, which is on a tangent parallel to and 81.5 ft. south of the tangent of the old Wahsatch tunnel of the original line with the new grade 41 ft. lower than the old one. This is shown in one of the illustrations. At the west portal the new line crosses under the old one on a flat skew, the old line being carried on a viaduct consisting of four 60-ft. deck girder spans supported on masonry abutments and two intermediate masonry piers, while the center support consists of a steel bent with a long cross girder placed astride of the new track passing underneath.

The site of this bridge is over a cut that had to be taken out before the structure could be built. The work was further complicated by a change in the alinement of the old track to replace a 5-deg. curve by one of 4 deg., a measure involving the shortening of the old tunnel by 80 ft. These tunnels are just east of Curvo which derives its name from a series of 10 reverse curves in a distance of two miles. As it has been suggested that some of these curves be eliminated by tangents on embankments between the adjacent



Tunnel No. 4

convex curves, the spoil from the new tunnel and its west approach cut was wasted where it would be applicable for this possible future purpose.

Tunnel No. 4 is 200 ft. long, extending through a short shoulder in the bluff near Castle Rock. It was driven entirely by hand work, using a center bottom heading into which the muck from the enlargement of the arch was trapped. The benches on either side of the heading were taken out last. The tunnel was lined with concrete throughout.

A Long Culvert Was Required

With the exception of a viaduct at tunnel No. 3 all structures on this project are arch culverts. The largest of these

16-ft. Arch Culvert Under 1,000,000-cu. yd. Embankment

is a structure of 16 ft. span under the 1,000,000-cu. yd. embankment, having a length of 464 ft. Owing to the heavy load which was imposed by the high embankment, it was deemed desirable to put this culvert on rock foundation and to accomplish this in a location that would give

the culvert a minimum length of barrel, 50,000 cu. yd. of excavation was required. The culvert contains 4,200 cu. yd. of concrete and is reinforced with 60-lb. rails curved to the shape of the arch. The concrete materials were brought to the site on a spur track carried nearly a mile from the old main line. The materials were unloaded from cars to storage piles by a locomotive crane and were transported to two ¾-cu. yd. Smith mixers in wheelbarrows. The concrete was delivered to the footings by chutes and to the neatwork by tram cars running on a trestle at a sufficient height to permit dumping directly into the forms. These cars were loaded by a bottom dump bucket lifted from the mixer to the level of the cars by a stiff leg derrick.

Construction Arrangements

The general contract for construction work was awarded to Kilpatrick Bros. & Collins of Beatrice, Neb., who divided the work among 10 sub-contractors on a joint account basis under which the general contractor shared equally with each sub-contractor in the net profits of the work. In general, the basis of payments for the excavation and embankment work was a schedule of unit prices for earth and classified material with definite overhaul allowances, applicable both to excavation in embankment and in borrow pits. With these schedules as a guide the engineers determined where the material was to be obtained to secure the cheapest embankment, each situation demanding its individual solution. The large embankment referred to previously was paid for on a flat price per cubic yard of borrow pit measurement, independent of the haul. The tunneling was paid for at a flat price per cubic yard of neat section.

This construction work has been under the direction of R. L. Huntley, chief engineer of the Union Pacific, with W. S. Woodworth, engineer in charge, the resident engineers being W. G. Tinney, H. C. Mann and F. W. Newhart. The entire project has been under the general supervision of E. E. Adams, consulting engineer of the Union Pacific System, New York City.

Fuel Situation in Russia.—The Russian fuel crisis, which became marked in 1916, has grown more acute this year. It is aggravated by the deterioration of the railway locomotives, which causes them to require a constantly increasing share of the fuel available for industrial purposes. The railways and the navy now require 60 per cent, and this porportion is expected to be increased steadily until the railways are bettered.

TRANSPORTATION OF NATIONAL ARMY TO TRAINING CAMPS

Plans for the largest movement of troops by railroad in the history of the country are now being perfected by the American Railway Association, at the request of the United States government. The citizens selected to form the National Army will begin to move to their respective training camps on September 5. The number to be selected stands at present at 687,000 men. The first movement will consist of approximately 30 per cent from each local concentration point, a total of about 200,000 men, and will begin on Wednesday, September 5, this date having been selected in place of an earlier date, at first considered, which would have brought the movement at the time of the rush of traffic incident to the Labor Day holiday. Entrainment is to be completed on Sunday, September 9. It is expected that a second movement of 30 per cent, or 200,000, will take place beginning on September 19, continuing for four days thereafter; and that a third movement of 30 per cent will begin on October 3, to continue for four days.

While plans for the National Army mobilization are being perfected the railroads are engaged in the movement of the National Guard to their training camps, which began last week and will continue in increasing volume until all have moved. This movement will include approximately 350,000 men and their impedimenta. The movement of troops and supplies to the seaboard for service abroad has also been in progress for some time but details regarding the transportation and as to the number of men involved must not be published.

The Old and New Lines—Looking East Toward Wahsatch

A total of 4,531 points in the United States have been designated by the Provost Marshal General as points of local concentration for the draft army, at one of which each individual will be required to report at a stated time and from which the parties will proceed by railroad to the 16 cantonments to which they have been assigned. The Provost Marshal General, through the state authorities, will retain control of these men until they are placed upon the trains designated, and will designate a man in each party to be in charge of it from each local concentration point to destination.

The American Railway Association has been directed to prepare schedules for the movement of each of these parties. These schedules are being prepared by the passenger associations in conference with representatives of the operating departments. They will show the date and hour at which

trains, either regular or special, may be expected at each local concentration point to receive the men departing from such point, together with schedules through to destination in each case. When these schedules have been approved by the quartermaster-general they will be furnished from the Washington office of the Railroads' War Board to all railroads and others interested in the movement.

The individual in charge of each party will hold tickets for each member of the party and will also be furnished with meal tickets, each having a face value of 60 cents, sufficient in number to provide for the food of all the men under his charge.

In preparing schedules due regard will be paid to the necessity for providing for the feeding of these men at convenient points, either by use of eating houses, dining cars, or by furnishing box lunches on the train. The meal tickets are redeemable at their face value on presentation to the department quartermaster at the headquarters of the department in which they are used.

The American Railway Association will place a qualified official of the passenger department in the office either of the governor, or of the adjutant general, as may be deemed most suitable by the state authorities in each state. This official will keep in touch with the state authorities in any emergency which may arise and will assist them in carrying out the schedule. The schedules which are used for the first movement will also be used for the second and third movements with such modifications, to be decided later, as may be essential.

Railroads have been instructed that it is necessary that railway passenger train equipment used for the movements of the National Guard or the National Army be immediately emptied upon arrival at the camps, and immediately returned to the road from which it was received. Orders for the disposition of the Pullman equipment released will be waiting for the cars at destination. Movements of empty passenger equipment, railroad or Pullman, according to the instructions, must be made with utmost expedition that it may be available for further service at the earliest possible moment.

The movements of National Guard troops up to date have been principally of advance contingents sent to training camps for work in preparing them for the larger number of men to follow. They have been moved in day coaches where the journey did not involve more than a day and a night of travel and in tourist and standard sleeping cars where the journey was longer. Where sleeping cars are used three men are assigned to a section.

1,200 RAILROAD WAR GARDENS

Nearly 1,200 "war gardens" are being cultivated this summer on vacant land of the Pennsylvania Railroad and its Lines East of Pittsburgh by employees for the use of themselves and their families. The value of the crops raised will probably exceed $250,000.

Altogether more than 1,000 acres have been planted, and are now producing crops of potatoes, peas, beans, tomatoes, corn, and various other garden vegetables. The average size of each plot of railroad land, tilled by an employee, falls just short of an acre.

Special arrangements were made this spring by the Pennsylvania Railroad to induce employees to take up unoccupied land belonging to the company, and plant it for the purpose of assisting in increasing the nation's food supply. Through the real estate department of the company, a plan was worked out whereby any employee could, without formality, obtain the use of as much land as he could properly cultivate, and upon a mere nominal rental. All that was necessary for an employee to do if he desired to raise a "war garden" was to apply to his superior officer and sign a simple form of lease. The land would then be placed at his disposal.

To encourage proper and scientific methods of cultivation, every employee undertaking to plant such a tract was supplied with a copy of "The Garden Primer," issued by the National Emergency Food Commission, and also a copy of a booklet on Potato Culture, which was prepared by the Agricultural Department of the State of Pennsylvania especially for the use of the Pennsylvania Railroad.

Since March 1, 613 new leases have been made covering garden tracts cultivated by employees of the Pennsylvania Railroad. In addition, 569 other tracts of the railroad's land are being cultivated on leases dating from previous years.

Besides the land used for kitchen-garden purposes, under nominal rentals, the Pennsylvania Railroad has leased to employees and others 649 larger tracts of land, owned by the company but not at present utilized for railroad purposes.

These tracts are being cultivated as farms, or are used for cattle grazing and similar purposes. Of these tracts, 231 consist of improved farms, and 89 of unimproved farms. There are also 315 large tracts used for pasturage, and 14 tracts for miscellaneous agricultural purposes.

New York Central Agent Counts on 10 to 15 Bushels of Beans

The illustration shows an employee's garden on the New York Central. The agent at Chaumont, near Watertown, N. Y., took a lease on a plot opposite his station, 1,500 ft.

A New York Central War Garden

long and 25 ft. wide. He reported to the manager of the road's farm bureau recently that this was the first time the land had ever been turned up by the plow and "heretofore was an ideal spot for all varieties of weeds." He planted one-quarter of his plot to white marrow beans and recently counted more than 32 full grown pods each on a number of the hills. He expects from 10 to 15 bushels of dry beans. He also reported that the further end of the garden was planted to Irish cobbler potatoes and that when he opened one hill 10 days ago he found one tuber "as large as your fist." Needless to say the garden is attracting more than passing attention from the summer tourists.

Report of English Railway Union.—The annual report of the National Union of Railwaymen of England shows that the number of branches has increased during the year from 1,240 to 1,270, and that the membership, inclusive of those at present absent from the country, has risen from 307,305 to 340,511.

What Is a "Fair Return" for Public Utilities?*

To Be Well Served We Must Let Investors Earn as Much as Men of Average Success Earn in Other Business

By William G. Raymond, C.E., LL.D.
Dean of the College of Applied Science, State University of Iowa.

SOME of you may wonder that an engineer, a man accustomed to deal with things rather than with ideals, to talk about tangibles rather than intangibles, to have visions of structures of wood, steel, stone, and mortar, rather than visions of social conditions; whose thought runs not in warm, musical, rhythmic measures, but rather finds expression in cold, hard statements of fact; some of you may wonder, I say, that such an one should be invited to address you, you a body of actual or potential teachers accustomed to deal with souls rather than things; to talk about intangibles rather than tangibles; to have visions of social conditions rather than visions of artificial structures; and whose training should tend to make the expression of your thought to flow in warm, measured periods rather than to burst explosively in cold, hard statements of dreary facts. And I wonder whether or not there is any significance in this, other than an indication of desperation on the part of the committee of arrangements, which has perchance found itself embarrassed in these times of business stress and activity. I wonder whether possibly it may be that we are coming nearer together in our thought and interest; whether possibly in this materialistic age, you of ideas and ideals, whose field of effort is the development of souls, and I of the field of steel and stone, may find it not without interest and possible profit to turn aside a little, each from his own field, to consider something that belongs in the area of no man's land, or rather everyman's land, that lies between us. I hope we may find it of interest and profit to consider for a little time a question that has puzzled lawyers and engineers, courts and commissions, and even those very positive people, economists and sociologists, namely: What is a fair return?

Dean William G. Raymond

From Three Standpoints

All too briefly for adequate consideration we shall try to discuss this question from three standpoints:

1. The fair return in private business.
2. The fair return for privately owned and conducted public service.
3. The fair return for benefits received.

I should like to consider it from a fourth and perhaps the most important standpoint of all, namely, fair return for personal service. But this question asked and argued through volumes already written, yet never answered, I could not hope even to formulate fully in two or three whole addresses, to say nothing of trying to discuss the question in the fourth part of one very brief address.

Doubtless those of you who have done your major work in economics or sociology will recognize early in the discussion that I am groping in a field already well explored by experts; but I believe it is a fair statement, to make, that no person or body of authority has ever answered the question, "What is a fair return," with finality. With respect to public utility corporations, those organizations that furnish us with water, light, heat, power, and transportation, the courts have said that the owner of a public utility property is entitled to a fair return on the fair value of his property used in the public service, but no generally accepted rule or method for determining fair value has been established, nor has an upper or lower limit of fair return been determined.

Everyone of us has contributed to the earnings of private businesses and public utility corporations. We have purchased various supplies from various tradesmen; we have paid railway and street car fares, bought electric power, gas and water, and we have somewhat arbitrarily and without much thought believed that we were paying too much, that the shop keepers and corporations were waxing fat at our expense. But how many of us have ever stopped to consider why men are in business and what they must earn to be called successful and be praised for their thrift, energy and foresight; and how many of us have considered with any care at all what we owe as fair return to those who have made it possible for us to prepare ourselves for service of a high order?

The Right to Earn a Profit

Considering first a private commercial enterprise it is perhaps trite to say that the right to earn a profit over and above expenses is conceded to all men engaged in such enterprises. To the private business man the public concedes the right to include a salary for himself in his operating expense and when he does this he gets a living out of the expense of his business, and his profit may be saved and accumulated from year to year until he has secured a competence, or a large fortune. He is rated as a successful man if he accumulates a competence, as a particularly successful man if he accumulates a large fortune, and so long as his acts are considered honorable he is praised for his intelligence and business ability and his advice may be sought on public matters. There is no limit set to his rate of profit or the magnitude of his operations. Except rarely in times of greatest stress, as a time of war, the law will not attempt to regulate his earnings, for that would be interfering with his inalienable rights, and to reduce his earnings would be taking his property without just compensation, which results in a violation of the constitution of this country. How large are the profits earned?

One business man is contented with a small rate of profit if it is enough to give him a modest living, while another is ambitious and seeks a larger rate and makes a larger effort in order to secure those luxuries and that position that a large income makes possible.

The Rate of Profit

The profit rate of return is frequently spoken of in ordinary commercial business, not as a rate on the capital invested, but as a rate on the gross business done. A corner grocer in the suburbs charges a large profit rate on very small

*An address delivered at the Mid-Summer Convocation of the State University of Iowa, Iowa City, Ia., on July 27.

sales that he may earn a modest living, while a Marshall Field, a Wanamaker, or a Woolworth collects a smaller profit rate on very large sales that he may earn for himself or his company a moderate rate of return on the invested capital, which moderate rate will yield a large annual income.

If on a capital of $1,000 a small dealer does a business aggregating $10,000 gross, he hopes to make say 10 per cent on the $10,000, or 100 per cent on the capital actually invested, but this is not profit, it is only salary which some people count as profit. As the extent of his operations increases and he does a business of $100,000 a year, he may hope for a net return of at least 5 per cent on his gross business over and above salary. As his business grows he invests more capital which he takes from his profits or borrows from the bank, and he does a business amounting to $1,000,000. On this he hopes to earn from 2½ to 3 per cent, or perhaps 10 to 20 per cent on his actually invested capital. When his business amounts to $10,000,000 a year, he is content with perhaps 2 per cent profit, or even less, on the gross volume of the business, since this will yield from 10 to 20 per cent on his actually invested capital and this has gotten to be so large that a smaller rate of return enables him to live in the manner he chooses, and the business is established and safe.

He could probably incorporate the business and sell the stock on a 5 or 6 per cent return basis, pocket the resulting profit, invest it in safe securities yielding 4 or 5 per cent, and spend the remainder of his days in such activities as might please him. This is the successful man—the more than average successful man. It is a lamentable fact that the average man in business is a failure so far as his business results are concerned. He may not go into bankruptcy but he takes $20 a week or $100 a month out of the business as salary, thinks he is earning a profit but really makes no profit at all, not even interest on his actually invested capital. Such a result cannot be called success.

Banking as an Example

Men who invest their money in a new banking business, one of the more stable and certain kinds of business, expect that their money will earn not less than 10 per cent and they hope for and usually receive considerably more than 10 per cent, which is partly paid in dividends and partly by payments to the surplus fund which increases the market value of their stock. When the business is well established and is earning on the average 10 per cent on the par value of its stock, men will be willing to invest in this stock at such prices as to make their return less than 10 per cent and often as little as 5 per cent on the investment. One of the great banks of New York pays regular dividends of 25 per cent quarterly, or a return better than 100 per cent annually, and occasional extra dividends of 100 per cent, and its stock is quoted at more than 40 times its par value. This bank has established an enormous business with a relatively small capital. It charges for its service no more than its service is worth else it could not do the business in competition with other banks. There are numerous other banks whose stock is worth several times its par value because of the large returns on the originally invested capital, and the existence of a large surplus, which returns and surplus have been realized by doing a relatively large business on a small capital.

Manufacturing and Contracting

When one goes into any manufacturing business or into a contracting business involving considerable risks, he figures to receive a large return rate because of the risk of actual loss or very small or irregular return, which frequently results. He plans to make from 50 to 100 per cent if all conditions prove favorable and to make 10 per cent if conditions prove to be as unfavorable as he thinks at all possible. Not infrequently conditions prove more unfavorable than he thought possible or he makes some mistake or oversight in his estimates and as a result he loses money; on the other hand occasionally conditions prove to be much more favorable than he had hoped for and he makes a large profit. The thinking public permits and expects such profits, and must pay them or it does not get its work done.

No Definite Fair Rate

These considerations seem to indicate that in private business there is no rate of return that can be called in general a fair rate of return. Any business man or corporation seems to be permitted by common public consent to earn any rate of return on the actually invested capital that is possible by honorable dealing. In general business then there is no standard for determining a fair rate of return. The laborer is worthy of his hire and whether he makes his talents return an hundredfold or only tenfold, he has earned no more than a fair return if he has dealt honestly and has not defrauded or oppressed his neighbor. Indeed, a fair return in general business might be defined as any return a business is able to earn fairly through the use of honorable methods.

As to Public Utilities

Does the same definition hold for public utility properties? In considering this question it must be remembered that men go into the business of furnishing public service—service that is generally recognized to be a proper, if desirable, public function—for exactly the same reason that men go into any other business, namely: to make money. Perhaps this is not the most laudable ambition and it may be that it is not to be compared favorably with the ambition of the scholar in pure science, whose ambition is to discover something new and valuable to the world; but it is an ambition regarded as worthy by most men, possibly because it is the principal ambition of most men. And it seems fair to say that the business man, who has reached the point where he is satisfied with simple interest on his money has passed the period of greatest usefulness to his community and to the world unless he devotes his life to gratuitous public service; he has lost his ambition to create wealth; (I believe the successful distributor of wealth is almost certain to be also a creator of wealth) he has lost a human quality most essential to the material progress of the world. Let it be granted at once that material progress is not more important than spiritual progress if indeed it is as important, but, also, let it be recognized that material progress is essential whichever sort of progress may be deemed the more desirable.

If then we prefer to have men of ambition and courage undertake to serve us in certain ways rather than to serve ourselves, to provide our water supplies, our light, heat, and power, and our transportation facilities, must we not expect to permit them to earn at least as much as men of average success earn in other business of equal risk and magnitude? Of equal risk and magnitude is a simple and well sounding phrase, but close acquaintance will develop difficulties of determination. On the other hand if we give these men of ambition and courage the practically exclusive privilege of supplying us with certain necessaries of life, may we not say to them: "You must deal fairly with us. You must charge us no more than the service is worth to us, and this must be determined by its cost to you, because its cost to you may be considered to be what it would cost us to serve ourselves. To this cost to you we shall expect to add a good profit to pay you for relieving us of the burden of serving ourselves, but we shall look to you to see that this profit is not more than successful men in private business of equal risk and investment expect to earn. Come, let us agree as to what this shall be and how we shall treat and share from time to time in the

beneficial results of advance in the art of furnishing the service you propose to furnish."

Necessities and Luxuries

It may be that the fair return will depend on the nature of the business. The furnishing of an absolute necessity, like water, by a monopoly company should call for a less rate of return than the furnishing of a luxury like gas or electricity for two reasons:

1. A sociological reason—because absolute necessities should be supplied always at the lowest possible cost.

2. A business or economic reason—because there is less risk in developing a property to supply an absolute necessity, for which there is no practicable substitute, than in developing a property to supply gas or electricity, either of which is always in partial competition with the other and both in partial competition with oil.

To be sure as time goes on gas and electricity tend to become necessities, but there is always much more to be done to develop this condition than to develop the necessity for a pure water supply. The possibility in the development of demand for gas and electricity is much more unlimited than is that of developing a demand for water. Though the demand for water may be limited, yet water will always be needed; it will never go out of style or be superseded by something better. Gas properties have already suffered by the introduction of electricity, and the art of electric lighting and power development and transmission is advancing so rapidly that new machinery and appliances of today must be discarded tomorrow. Functional depreciation allowances must be large or great risk must be recognized as a reason for allowing a high rate of return.

Capital and Interest Rate

Again different businesses require differing ratios of capital to annual volume of business done. The successful private mercantile business has as a rule gross annual receipts far in excess of its invested capital, so that 2 per cent of the gross annual receipts may mean from 6 to 20 per cent of the invested capital, while in a railroad business one finds exactly the opposite condition. In this business the invested capital is always larger than the gross annual receipts, so that, as an average for the United States, perhaps it is fair to say that a profit of 20 per cent of the gross annual receipts will mean not more than 5 per cent and perhaps less on the honestly and reasonably invested capital. Thus a relatively large rate of return measured as a percentage of business done must be allowed such enterprises in order to make the return measured as a percentage of invested capital compare favorably with the returns in purely private enterprises.

The legal rate of interest in a given state or country may influence the conclusion as to fair rate of return. If the legal rate has been determined by the people to be 6 per cent and not more may be charged without involving the charge of usury, then it would seem to be clear that 6 per cent is not enough to warrant a company investing its money in a business which requires effort and the taking of certain risks from both of which the money lender is free, if he lends on good security.

Is 6 Per Cent Enough?

The foregoing matters influence private business as well as privately owned public utilities; the two are unlike only in the greater degree of control exercised by government over public utilities, and the fact that these are as a rule more nearly monopolistic in character than private business, which though not always so, is more often entirely competitive. Because of the monopolistic feature of public utility service, a feature in some cases less existent than is often supposed, we are apt to feel that such enterprises should be subject to many more restrictions than private business, and that they should be limited to a very moderate rate of return on their invested capital, some persons believing 6 per cent to be sufficient. The considerations thus far developed ought to indicate that no uniform rate of return can be fixed that will be fair to all utilities; that we cannot expect business men to go into public business with an expectation of earning less than they could earn with any success in other enterprises of like risk and magnitude, because they go into public business for the same reason that they go into private business—to make money—and until private business is limited by law there would seem to be no good reason to limit the earnings of privately owned public utilities to less than the return of the average successful private business of like risk and magnitude. No definite percentage can be fixed as measuring this return, but that it is more than the 5 or 6 per cent that some would fix as the limit, a glance at a purely hypothetical but entirely reasonable example will serve to show.

The banking business, while competitive and complex in its details is in general theory one of the simplest businesses to reason about, and being pretty well controlled by law furnishes a fairly good example from which to begin reasoning with respect to other business. It involves some risks but when well managed is perhaps reasonably free from most of the risks attending many other kinds of business. The banking company has capital invested, and generally the law makes it necessary that its capital shall be all actual; that if $100,000 of capital stock is issued, $100,000 of cash must be behind it actually paid into the treasury of the company. The banking company has operating expense consisting of rentals, stationery and printing, advertising, wages, and other incidentals, and interest paid to depositors. It performs service for its depositors, stores their money, furnishes them with books, checking blanks, etc., and pays out their money on their order, keeping track of receipts and payments. For the use of the depositor's money, the company pays this service and from nothing to perhaps, 4 per cent interest. The rate depends on the character of the deposits, whether savings or open account, and on their magnitude, very large open accounts receiving, perhaps, 2 per cent on the average daily balances, small accounts nothing.

The banking company lends its depositor's money to others and charges from 5 to 8 per cent or more depending on the size of the loan, the nature of the security furnished, the law fixing the maximum rate, the demand for money, and competition, although there is little variation in the rate due to competition. It also has a small amount of incidental charges for commissions, protests, etc. As a result of its charges and expenditures the company may clear from 1 to 2 per cent on the loans; that is to say, if the average interest charges are, say 6 per cent; then from 1/6 to 1/3 of its charges or gross business will be profit. If a banking company with $100,000 capital has loans amounting to $1,000,000, which is a not uncommon ratio, and its average interest charge is 6 per cent yielding $60,000, and if 1½ per cent on the loans, or a quarter of the charge is profit, the banking company earns net $15,000, or 15 per cent on its invested capital.

This is not at all an unusual or peculiar result of the operation of a moderate banking business in a moderate sized community. It will be noted that as in the case of railroad property, the income is less than the capital. If the loans are two million dollars with the same ratio of expense and profit, the net earnings will be 30 per cent on the capital, while if the loans are only half, or $500,000, the net earnings will be but 7½ per cent on the capital. Of these two latter conditions the first is rare and represents unusually profitable business, and the second, though not to be called rare, represents somewhat less than an average success in banking. In the first case the income is more than the capital.

If the foregoing is fairly representative of the conserva-

tive business of banking—a business hedged by regulatory statutes—and such results are recognized as fair and reasonable, does it not appear that we should hesitate to limit any public utility to a 5 or 6 per cent return on the capital reasonably invested?

Reasonable Attitude

Now without question when business properties, any of them, purely private or privately owned public utilities, are firmly established and earning, say, 15 per cent on the outstanding capital, there will be those who will be glad to buy the securities on a 5 per cent basis, and the market price of the stock may be 300, or three times its par value. The stock may then be increased—watered as it is sometimes called—to three times the original amount, and the increase distributed gratis to the stockholders of record. Other things may be done that are less defensible. It has been not uncommon for public utility corporations to keep their evidences of capital, bonds and stocks, at such an amount that the return should appear to be not more than from 5 to 8 per cent, largely because of the fear that the public noting larger returns would take action to reduce the earnings.

This would be made unnecessary by a reasonable attitude of the public toward its service corporations; a realization that those engaged in public utility work are not public agents entitled to a wage only and guaranteed that wage, but that they are business men engaging in a business for the same reason that other men engage in other business, *with no guarantee against failure,* and that subject to certain limitations of fair dealing when supplying common necessities, they are entitled to make their talents earn other talents just as other business men, praised for their foresight, judgment, and ability, make their talents earn other talents.

Must not the conclusion of the matter be that the "fair return" on the "fair value" of a public utility property, that the courts have talked about so much and have judged to be the right of every public utility corporation to earn, means any return the corporation can earn by honorable methods when operating freely without rate regulation, so long as it does not exceed on the reasonable investment, the rate of return expected by the man or corporation of average success in other business of equal risk and magnitude; and may not the rate exceed this average successful rate if thereby incentive is given to develop economies in which the public may share?

Plea for an Open Mind

My plea is not for the corporation but for an open mind when considering great questions of public policy; for a spirit of fairness when considering private or corporate acts as they affect us; for freedom from hasty judgment without adequate evidence. You all have read of the plea of the railroads to the Interstate Commerce Commission to be allowed an advance in rates in this time of high prices and increased expense due to governmental action fixing the length of the working day. Many of the larger private businesses, some, to be sure, whose prosperity is closely linked with railroad prosperity, have seen the justice and need of an increase in transportation rates, but the farmers of the country have appeared by counsel before the Commission to try to prevent the increase in the rates. The farmers of the country are heavy shippers and feel the effects of changes in rates, but it is worth while to call attention to a fact brought out in a recent editorial in the *Railway Age Gazette,* that whereas farm products have increased in value tremendously in the past six years, railway rates have stood almost still. In 1910 the freight rate on wheat from Chicago to New York was 11 per cent of the farm value of the wheat; last year it was only 6.3 per cent of the farm value of the wheat. In 1910 the freight rate on corn from Chicago to New York was 18.6 per cent of the farm value of the corn; last year it was but 10½ per cent of that value. To increase the rate by the amount asked by the railroads would advance the freight charge on grain but a very small amount measured as a percentage of the value of the grain, and would leave it still much less than it was a few years ago.

I am not arguing the case of the railroad. I do not say whether the increase demanded is necessary; there are other factors to be considered; but I call attention to this curious fact to emphasize my plea for an open mind in considering questions of public and private concern, and for fair dealing between men. The need must be evident from this example of the farmer and the railroads. It may be that in the years to come government will over-turn all the theories of supply and demand, of competition and combination, now held by economists, and will fix the reward for all public and private effort. I do not look for this time in the near future, and until it shall come, who shall say with justice that this man may make his talent earn ten talents, but this other man shall make his talent earn but one talent? Let us be fair.

HEAVIER CAR LOADING AND THE RAILWAY BUSINESS ASSOCIATION

Winning the war by making every freight car do all it can has now enlisted in cooperation with the Railway Business Association trade organizations having a total membership of 20,000. These are national, state and local bodies which have recommended to their members the performance record blanks through which the president of each company can measure from month to month the progress maintained by his shipping department. A vigorous effort is afoot to extend the number of the associations participating in this movement in order that the heavy traffic of coming months will find thousands more shippers conserving car supply by system.

George T. Smith, of Jersey City, chairman of the Association's Freight Car Thrift Committee, has made public the names of 40 bodies which have already responded. He issues a new appeal to the others. All the secretary of such an organization has to do is to multigraph a letter, ask the Railway Business Association for the requisite sets of blanks and drop in the mail.

Following are the organizations which have recommended performance record blanks to their members:

American Face Brick Association.
American Feed Manufacturers' Association.
American Hardware Manufacturers' Association.
American Iron, Steel & Heavy Hardware Association.
Associated Industries of Massachusetts.
California Redwood Association.
Carriage Builders' National Association.
Hardwood Manufacturers' Association.
Hard Yarn Spinners' Association.
Illinois Manufacturers' Association.
Knit Goods Manufacturers of America.
Manufacturing Chemists Association.
Michigan Manufacturers' Association.
National Association of Automobile Accessory Jobbers.
National Association of Furniture Manufacturers.
National Association of Garment Manufacturers.
National Association of Glue and Gelatine Manufacturers.
National Association of Stationers and Manufacturers.
National Association of Stove Manufacturers.
National Confectioners' Association.
National Lumber Manufacturers' Association.
National Machine Tool Builders' Association.
National Paper Trade Association.
National Petroleum Association.
National Pipe and Supplies Association.
National Varnish Manufacturers' Association.
National Wholesale Grocers' Association.
Ohio Manufacturers' Association.
Richmond, Va., Chamber of Commerce.
Rochester, N. Y., Chamber of Commerce.
Rubber Association of America.
St. Joseph, Mo., Commerce Club.
Silk Association of America.
Sioux City, Ia., Commercial Club.
Southern Hardwood Traffic Association.
Southern Pine Association.
Southern Supply and Machinery Dealers' Association.
Syracuse, N. Y., Chamber of Commerce.
Toy Manufacturers of the U. S. A.
United States Sugar Manufacturers' Association.

Possibilities of a Market-Train Service*

Primarily Designed to Aid Small Producers and City Consumers and to Operate Over Short Distances

By G. C. White and T. F. Powell
Transportation Specialists, Office of Markets and Rural Organization.

IF the statement be true that more than one-half of the industrial and commercial energy of the civilized world is expended in the provision and preparation of food, it becomes all the more important, as the density of population and the economic conditions of the United States approximate those of the Old World, that the producing areas in the vicinity of large consuming centers be utilized to their full capacity, and that the products of such areas be accorded an efficient and economical transportation service.

Conditions controlling the commerce of England have developed a railway freight service characterized by light trains of high speed and frequent movement, cars of small capacity and very low minimum weights. The settlement of the greater part of the United States and its industrial development followed the advent of the railroad. The long distances separating the sources of raw material from the mills and factories utilizing it, as well as the character of the raw material, have developed high minimum weights for large cars of great weight capacity drawn in heavy trains by powerful locomotives. The development of these features of the freight service of the railroads of this country has received relatively more attention than has been given to the improvement of facilities for short-distance local traffic.

The greater part of the trading at the principal live-stock markets of the United States is done on certain designated days each week, and special trains carrying nothing but live stock reach these markets in large numbers on those days. From a comparatively small area in the Imperial Valley of California approximately 5,000 cars of melons are shipped to market each year, the bulk of the crop being handled during four weeks in June. During the height of the shipping season special trains carrying nothing but melons move east across the desert. From certain of the Gulf ports special trains carrying only bananas run on frequent and fast schedules to northern cities. Solid trains of milk daily supply New York City with that commodity. All these may be termed "special market trains," and, for the most part, they are additional examples of the efficient handling of long-distance, high-speed traffic of large volume.

In that section of the United States lying north of the Ohio and Potomac rivers and east of the Mississippi, known in railroad parlance as official classification territory, has taken place the greatest industrial development of the country. Here is situated much agricultural land in small units, the individual farm yielding dairy products, poultry, small live stock, and fruits and vegetables, which mature at different seasons, and produce less than a carload quantity of any commodity at one time; here are our most populous cities, daily demanding a supply of perishable foodstuffs; and here density of population and economic conditions are beginning to approximate those of the Old World. In this section are presented many opportunities for developing the possibilities of a market-train service along the lines of the service now furnished by milk trains.

Steam and electricity in passenger transportation have relieved some of the congestion of the population of large cities, but the suburban development of residential districts has withdrawn a proportionately much larger area from tillage, until most of the market gardeners have been pushed back beyond wagon range of the city markets, and many of them beyond the range of the autotruck. Coincident with this development has come the increasing demand for greater quantities of foodstuffs, and it becomes necessary, therefore, that the commutation passenger service of the large cities find its counterpart in a similar freight service. The relatively small number of postal cars as compared with freight cars, or even with express cars, makes improbable any considerable amount of relief by the parcel post at the present time, and express service has not fully met the need.

The limited market-train service maintained by certain of the roads serving New York City, and the somewhat more extensive service of the same kind maintained by roads serving Philadelphia, were foreshadowed in some of the marketing practices which developed with the construction of the first railroads in the United States. Following the analogy of turnpike operation, the first railroad companies furnished roadway only; horses were the only motive power; farmers furnished their own motive power, paid the necessary tolls for the use of the track, and hauled their produce to market in their own vehicles.

More than 50 years later, in 1888, the reports of the Interstate Commerce Commission disclose a special market-train service by four of the railroads leading to New York City, and doubtless there were other roads that offered a similar service. The service consisted in transporting on the daily milk trains, in the same cars with the milk, such commodities as fresh meat, berries, butter, and eggs, and in returning to the shippers the empty containers, such as meat baskets, berry and egg crates, and butter carriers.

The rapid increase in the milk business and other conditions peculiar to its transportation and marketing in the course of time made it necessary to restrict the milk cars almost exclusively to the transportation of milk. However, many, if not most, of the tariffs covering the transportation of milk to Boston and New York include pot cheese as a commodity which may be included in mixed carload lots of milk, cream, and buttermilk. A railroad in Vermont and another in Massachusetts permit the transportation of butter in milk cars, and a road in Maine includes eggs. One road serving sections of Pennsylvania and New York and participating in the New York City milk traffic handles in its milk cars practically every class of farm produce except fresh meat. Another road serving an extensive section of New York makes tariff provision for a similar service by its milk trains. One of the trunk lines serving New York City has had in operation since 1890 a produce train giving a carload service for farm products on one of its divisions; and on another division the same class of commodities is given a less-than-carload pick-up service by milk trains.

The examples given of special facilities and service, in the transportation of less-than-carload quantities of farm products, are merely some of the best-known examples and, of course, do not include all the cases throughout the country to which attention might be called. The most conspicuous examples are the market trains running to Philadelphia over the rails of two of the carriers serving that city.

The first road runs its market trains over the several divisions only once a week. The trains leave the most distant stations, some 60 miles from Philadelphia, about 7.30 a. m. and reach Philadelphia about 2 p. m. Some of the cars used are box cars fitted with adjustable ventilators in the

*Abstract of a bulletin issued by the Department of Agriculture.

doors and in the side walls. Some of the cars are equipped with hooks along the walls for hanging fresh meat, a fact which makes it easier to keep the meat both clean and cool. Some of them are combination stock-and-poultry cars, one end being slatted for small live stock and the other end of the solid, box type for the reception of coops of poultry. Refrigeration by means of ice bunkers built into the cars is unnecessary because of the short time of transit. Some of the cars are assigned to the more important stations and are lettered with the name of the station to which they are assigned.

The rates named are any-quantity rates, and range from 10.5 cents to 28.4 cents per 100 lb. They apply on "marketing," which is defined as including dairy products (except milk or cream); poultry-yard products; products of the orchard, garden, or farm; fresh or dried fruits or vegetables; and such small live stock as calves, sheep, lambs, pigs, and hogs. The charges must be prepaid or guaranteed; and the rates apply only on shipments handled on designated market trains.

The railroad disclaims responsibility for loss or damage resulting from neglect on the part of marketmen to comply with its instructions, which read as follows:

> All marketing must be properly packed for safe transportation and protection against loss, theft, or damage to contents of packages, plainly marked with consignee's name, and promptly and properly claimed upon arrival of market train at destination.

The suggestion is made that, for obvious reasons, shipments should be accompanied by the owners, but the freight rate does not include the transportation of the owners; they have to pay passenger fare.

The facilities are excellent for handling and taking care of the shipments on the arrival of the market trains at Philadelphia. The terminal station for the market trains is centrally located, directly adjacent to a wholesale market, and is itself equipped with a cold-storage plant. Immediately on the arrival of the trains the shipments are unloaded. They can be transferred directly from the cars to the station cold-storage rooms, or to stores of dealers in the wholesale market. If it is desirable or necessary to take them to other parts of the city, it is possible to unload them directly from the cars into wagons backed up to the cars. Apparently the one thing lacking to make the facilities complete is a retail market or a row of farmers' stands along the sidewalk in front of the station. Under the plan of this railroad, the freight is handled and delivered in the same way as general merchandise.

The second road inaugurated its market-train service more than 25 years ago. The trains are run daily, except Sundays and holidays, and the speed is that of the average passenger train. The farthest point served is not more than 75 miles distant from Philadelphia; consequently there is no need for car-lot refrigeration, although some shippers at times do ice their own packages.

The rates charged the shippers are slightly higher than the first-class freight rate, ranging from 15.8 cents to 31.5 cents per 100 lb. and applying on "marketing" "carried on market or milk trains, when accompanied by shipper holding trip or excursion ticket." The tariff naming the rates is an intrastate tariff, and does not give a list of the articles or commodities included in the general term "marketing." The charges must be prepaid, and the rates include the return of empty containers.

The principal retail market of Philadelphia occupies the street-level floor of the passenger terminal of this company, but this is not the terminal for its market trains. Freight arriving by market trains is delivered at freight stations at other points. On the whole, the facilities at these stations are not so good as those of the other road whose service has been described. Shippers or their representatives must be on hand, on the arrival of the trains, to claim and unload the consignments, as the carrier does not perform this service. The transportation is at owners' risk, the carrier disclaiming responsibility for count or condition of the packages on delivery.

Results and Advantages

It must be borne in mind that a market-train service, such as is discussed here, designed primarily for small producers and city consumers, is of equal advantage to the carriers, and is in fact an economic necessity. It is of no interest to growers whose production is sufficiently large to enable them to ship in carload lots; nor would it be of any advantage to those communities where co-operative associations have united to combine into carload shipments the output of many small farms devoted to the production of the same commodity. When the distance to market is so great as to make protection of perishable commodities by refrigeration necessary, shipping in carload lots is essential for that reason alone. Aside from the question of refrigeration, and regardless of distance, producers should combine their shipments into carload lots, whenever it is possible, for economy in transportation charges. But, for farmers living along a single operating division of some railroad, within a hundred miles of a large city, or along a branch line terminating at some large city, who can produce a variety of foodstuffs almost continuously the year round, a market-train service would be of the greatest advantage.

The fruits and vegetables on such farms mature at intervals throughout the summer; the dairy products, eggs, and poultry, to say nothing of such commodities as apples and potatoes, can be shipped throughout the year as they are ready for shipment or as the market demands. There is not enough of any one commodity on a single day along the entire division or branch line to make a carload, even if it were otherwise feasible to combine it into a carload; and there is not enough of all commodities at one station on a single day to combine into a carload, even if the great variety of products and containers did not make it impossible to load the usual minimum weight into a single car. Such are the products of farms of this kind, and the success or failure of the farmers is in proportion to their ability or inability to market their products at a profit.

Other things being equal, the market nearest to him is the best market for the small farmer who produces a great variety of commodities and does not specialize on one or two. As has been shown, distant producers can reach any market with car-lot shipments, while the small producer here described, unable to ship in carload lots, is confined to the near-by market. His nearness to the market enables him to keep in closer touch with market demands, and he can quickly adjust his supply to the demand. To a distant shipper, large quantities in transit may bring loss by reaching destination on a falling market. In comparison with the large producer, the small farmer is doing a retail business. With a retail market adjacent to or in the city terminal of the market train, he would be in a still better position to do a retail business in every sense of the word and to sell directly to consumers.

This is just what was done during a part of the summer of 1912 in the case of a market train run to East Pittsburgh, Pa., by one of the roads serving that point. The farmers shipping by the train were organized in a farmers' exchange association, and the association had a representative at East Pittsburgh, who disposed of the shipments. Some of them were sold to wholesale and retail dealers, but the greater part was sold to factory employees. While the usual facilities of a retail market were wholly lacking, the service quickly developed a retail market, as sales were made in the railroad yard directly from the car to the householder. So popular had the service become and so great a reputation had it attained at the time it was discontinued, that a more affluent class of people was beginning to take advantage of it, some

of them coming long distances by automobile to do their daily marketing there.

Apparently all classes of people who bought supplies of foodstuffs here found some advantages over previous methods. It is quite evident that those who came long distances to buy got either a better quality of goods or lower prices, if not both.

This particular service was given for only 46 days during the months of April and May, when it was discontinued. The reason given for its discontinuance was that the terminal facilities were not satisfactory to the health authorities from a sanitary standpoint. The season of the year and the short period during which the train was run did not give sufficient opportunity to make a correct estimate of its probable continued success. Apparently there was no lack of patronage.

Factors Necessary to Success

Market-train service is not a panacea for all the ills that afflict the small farmer in the marketing of his products. Every item of labor performed by the farmer in serving the consuming public is from one point of view an element of his co-operation with others. From the standpoint of his returns for the service that he performs he alone is responsible for the efficient performance of many of the items of labor. Sometimes he fails to recognize fully his own responsibility in co-operative effort, and sometimes he is mistaken in the causes to which he attributes the failure to market his products at a profit. Again he alleges cheaper methods of production on the part of his competitor or a disadvantage against himself in the matter of freight rates.

Mention has been made of co-operative associations whose efforts are directed toward consolidating into carload shipments the output of many small farms producing the same commodity. A market-train service with adequate terminal facilities in the way of a retail market offers an ideal opportunity to the producing community served of forming a co-operative association for the sale of its products directly to city consumers. No better opportunity can be asked for restoring the custom of direct exchange between producer and consumer, as far as it is possible to restore it, in those sections where changing economic conditions coincidentally have brought about the abandonment of that custom and have developed the necessity for a market-train service. With a representative of the association at the terminal to dispose of products directly to householders, all questions of variation of price on account of quality and condition are determined at the time of the sale by an actual joint inspection of the commodities by the seller and purchaser; no vexatious correspondence is afterwards necessary in adjusting claims—correspondence which may terminate established business relations by arousing mutual suspicion of lack of good faith; and, what is by no means the least important advantage, it is a cash transaction and the purchaser avoids the annoyance of remittance by letter.

As a step toward the successful marketing of his products, the farmer must be brought to a realization of the justice of many of the criticisms against some of his methods. He must produce the commodities that the consumer wants; and only their superior quality will command prices higher than are being paid for the same commodities shipped from remote sections. If his products are not graded as carefully nor packed in containers as attractive as those of the long-distance stuff, he will not get the prices that are paid for the long-distance stuff.

One of the roads furnishing a market-train service to Philadelphia states that if the service were not already established it is hardly likely that it would be established "in view of the very light yield of revenue therefrom." As the inauguration of the service in the beginning was the result of judgment based on careful estimates, no figures of actual operation being in existence, the statement would seem to indicate a desire to withdraw the service. The road that served East Pittsburgh in 1912 rendered a similar service at two other cities, Butler and Allegheny, Pa., from 1907 to the close of 1914, when the service was discontinued. The service to East Pittsburgh was inaugurated under the jurisdiction of the passenger department, as it was intended at first to handle the shipments on passenger trains. Later it became necessary to transfer it to the freight-traffic department. This road handles a large volume of heavy traffic to and from the iron and steel mills in the Pittsburgh district. Eighty-eight per cent of its entire tonnage for the fiscal year 1915 consisted of products of mines, while its total tonnage of agricultural products and products of animals was less than four-tenths of 1 per cent of its entire tonnage. Under the circumstances it readily can be seen that a market-train service would be of little interest to its freight-traffic officials from the standpoint of either tonnage or revenue.

It is true that some producers have begun to utilize the parcel post to some extent and that the reduction in interstate express rates which became effective in the early part of 1914 has attracted some shipments by express. In some sections freight service by interurban electric lines has afforded a slight measure of relief, but the advantages of that kind of service are too frequently offset by the lack of adequate and centrally located city terminals and the restrictions imposed on the running of freight cars through city streets. In some cases the growth of intermediate towns has attracted a considerable portion of the commodities that formerly went to the large city terminal. City boards of health have imposed restrictions making it necessary to exclude other commodities from milk cars, which increases the cost of performing the transportation service on lines where one car would hold all the shipments. This competition is pointed out by roads now giving a market-train service; and roads that do not now give such a service offer these and other facts as objections to its inauguration.

The small farmer is dependent on either local freight-train service, which is too slow, or on express service, which relatively is too expensive. The slowness of local freight-train service was pointed out in the Report of the Mayor's Market Commission of New York City, submitted in December, 1913, where it was said that it took from ten days to two weeks to get freight from some places distant for passengers only two hours from New York. The same conditions that now prevail with reference to the transportation of small quantities of miscellaneous foodstuffs formerly prevailed with reference to the transportation of milk to the large cities. The problem was solved in the case of milk, and it would seem that it can be solved as readily in the case of the other commodities. To cut off a city's supply of milk produces a crisis quickly; attention is called sharply to the situation, and a remedy is devised promptly. Lack of marketing facilities for the small farmer affects the producer more vitally than the city consumer, but the bad effects, while they make themselves felt more slowly, are none the less sure and none the less harmful to the community at large.

A market-train service affords an excellent method of restoring, as far as it can be restored, where it has been abandoned, the custom of direct dealing between producer and consumer. It contemplates the shipper loading his products into the car at point of shipment and taking possession of them immediately on arrival of the train at destination. There should be a retail market, or at least a wholesale market, in or adjacent to the city terminal. The service is more valuable to the shipper than ordinary local freight-train service. The time in transit is practically that of trains carrying express matter, but collection and delivery is made by the shipper. Such a service, to be successful, depends on the organized effort of the producing community intelligently directed in sympathetic co-operation with the carrier.

TRAIN ACCIDENTS IN JUNE[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of June, 1917:

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
7.	C., R. I. & P.	Freeburg,	bc	P. & F.	1	17
13.	N. Y., N. H & H.	Vestfield,	rc	F. & F.	1	0
13.	A., T. & S. F.	Flynn.	bc	P. & F.	2	3
22.	Ky. & Ind. Ter.	ouisville,	xc	F. & F.	1	1
29.	N. Y. Central	Alliance, O.	bc	F. & F.	0	9
29.	Baltimore & Ohio	Freeport,	bc	F. & F.	1	1
*30.	Seaboard Air Line	Franklinton.	bc	F. & F.	4	2

Derailments

Date	Road	Place	Cause of Derailment	Kind of train	Kil'd	Inj'd
5.	Chicago, B. & Q.	Keokuk,	slide	P.	..	..
9.	Wabash	Benton City,	b. rail	P.	0	5
14.	Atchison, T. & S. F.	Haynes.	Exc.speed	P.	1	12
*20.	Toledo, St. L. & W.	Kirkpatrick.	.....	F.	..	..
20.	Penn	Bellaire.	.....	P.	1	..
23.	Central Ga.	Rossville.	.....	F.	1	2
24.	A. C. L.	Dillard.	.....	P.	2	3
25.	Del. & Hudson	Putnam.	d. track	P.	0	9
25.	Detroit, T. & I.	Waverly.	bridge	F.	3	0
26.	S. A. L.	Stanley.	d. track	P.	0	17
27.	Boston & Maine	Milton.	acc. obst.	P.	0	0

The trains in collision at Freeburg, Mo., on the 7th, were westbound passenger No. 23, and eastbound local freight No. 84. The engineman of the passenger train was killed and five trainmen and twelve passengers were slightly injured. Damage to engine and cars about $1,000. Train No. 23, due at Freeburg at 12:12 p. m., had an order to wait there until 12:20 p. m. for No. 84. The conductor of 84 telephoned from a gravel pit to Argyle that he probably would remain there for No. 23 and not try to go to Freeburg, and this information was transmitted to the despatcher. The despatcher, assuming that this was definite information, annulled the wait order so far as No. 23 was concerned, but did not send the annulling order to 84. On receipt of this order No. 23 left Freeburg, at 12:18 p. m. It met the freight about a half mile west of the station in a deep cut on a sharp curve, the conductor of the freight having decided to try to reach Freeburg. In doing this, however, it appears that he was taking a desperate chance, as, according to the rule, he should have been clear of the main track at Freeburg at 12:15. No person on the freight train was injured.

The trains in collision at Westfield, Mass., on the 13th, were southbound freights. The leading train had been unexpectedly stopped and was run into at the rear, within a few minutes, by a following freight, No. 1181. One brakeman of train 1181 was killed. The cause of the collision was failure of train 1181 to run under control within yard limits.

The trains in collision near Flynn, Okla., on the 13th were westbound passenger No. 411 and an eastbound extra freight. One engineman was killed and the other was fatally injured. Several passengers were injured. The collision was due to the overlooking of meeting point by the engineman of the passenger train.

The collision in Louisville, Ky., on the 22nd, about 1 a. m. was between a freight train and a string of cars which had become uncontrollable while being moved on a side track and had fouled the main track.

The trains in collision near Alliance, Ohio, on the 29th, were through freights. Both engines and two cars were wrecked. Nine trainmen were injured. The cause of the collision was disregard, on the part of one of the trains, of a despatcher's order fixing a meeting point.

The trains in collision near Freeport, Ohio, on the 29th, were a westbound freight and an eastbound locomotive running without train. The collision occurred on a bridge and one engine fell to the creek below. One engineman was killed and one fireman and one brakeman were injured. The collision occurred at 1:07 a. m. The engineman of the eastbound engine had overlooked an order requiring him to meet the westbound train at Freeport.

The trains in collision on the Seaboard Air Line near Franklinton, N. C., on the 30th of June were fast freights. Both locomotives were wrecked and 20 loaded cars were demolished or badly damaged. The wreck took fire and the combustible portions of the locomotives and cars were burnt up. Four trainmen were killed and one was injured. The collision was caused by the failure of the operator at Franklinton to deliver an order to the northbound train; and also his failure to carry out the manual block signal rules. According to press despatches, this operator was in court a short time after the collision, and was convicted of drunkenness and disorderly conduct. The same despatch says that the operator was placed in jail, on a charge of manslaughter, to protect him from possible mob violence. The collision is described as very violent. Both trains were running rapidly downgrade and they met in a hollow on a curve. The two engines, both heavy, were buried under the wreckage of 20 heavily loaded cars. The wreck burst into flames immediately and everything of a combustible nature was consumed.

The train derailed near Keokuk, Ia., on the fifth, was a southbound passenger. The train ran into a landslide and the engine and four cars were overturned.

The train derailed near Benton City, Mo., on the 9th, was an eastbound express passenger. Six passenger cars left the rails and five passengers were slightly injured. The cause of the derailment was a broken rail.

The train derailed near Haynes, Cal., on the 14th, was an eastbound express. The engine was overturned and the first two cars were wrecked. The fireman was fatally injured and 7 passengers, 2 employees and 3 other persons were less severely hurt. The derailment was caused by excessive speed over a curve of 8 degrees.

The train derailed at Kirkpatrick, Ind., on the 20th, was an eastbound freight. In the train were seven cars of oil which took fire. The fire was followed by an explosion and about one hundred houses, nearly the whole of the village of Kirkpatrick, were destroyed.

The train derailed near Bellaire, Ohio, on the 20th was an eastbound passenger. The engine was overturned and the engineman was fatally scalded.

The train derailed near Rossville, Ga., on the 23rd was a work train moving northward. The engineman was killed and two other trainmen were injured.

The train derailed near Putnam, N. Y., on the 25th, was southbound passenger No. 2. The train was running about 40 miles an hour and the engine and 5 cars were ditched. Five trainmen, three mail clerks and a news agent were injured, none seriously. The rails spread under the engine, caused by a slide in the embankment.

The train derailed near Waverly, Ohio, on the 25th at 4 a. m. was a southbound through freight. The engineman and fireman were fatally scalded and one trainman was killed. The derailment was due to the weakening of a trestle bridge by fire. The fire is believed to have been incendiary.

The train derailed neared Stanley, N. C., on the 26th, was westbound passenger No. 31. Two coaches were ditched and 17 passengers were slightly injured. The train was running about 40 miles an hour and the derailment was due to distortion of the rails on a three-degree curve by solar heat.

The train derailed near Milton, N. H., on the 27th, was a southbound express. The engine and one car were thrown off the track at a crossing, by striking an automobile, a touring car. Only one person on the train, a passenger, was injured, and the injury was slight; but the occupants of the automobile, a man and a woman, were killed.

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

Increased Utility of Modern Malleable Iron

Facts versus Current Fallacies Regarding the Manufacture and the Physical Characteristics of the Metal

By A. H. Weston
Sales Engineer, T. H. Symington Company

THERE are a number of fallacies, both in connection with the manufacture of malleable iron castings and with the physical characteristics of the metal itself, which are unfortunately still entertained as facts by many engineers. These fallacies, based largely on hearsay, and to some extent on experience with the product of manufacturers who have

Fig. 1—Malleable Iron Wedge Tested Under a Light Drop Hammer

not kept in touch with developments in this industry in the past few years, may be cited as follows:

(1) That the strength and ductility of malleable iron castings lie principally in the skin.

(2) That malleable iron castings with thickness of sections exceeding ½ in. cannot be completely annealed.

(3) That malleable iron castings are frequently over annealed.

(4) That the ultimate tensile strength of malleable iron does not average much over 40,000 lb. per sq. in., and the average elongation does not exceed 6 per cent in 2 in.

(5) That malleable iron is frequently unreliable due to non-uniformity in methods of manufacture.

The outer skin of a malleable casting does not by any means supply the major part of its strength and ductility, as the core has both of these qualities. In fact, there is very little, if any, difference between the strength of the metal in the core and that in the skin.

A malleable iron wedge is shown in Fig. 1 which has been subjected to the wedge test adopted as one of the standard test practices of the Associated Manufacturers of Malleable Iron. For this test the wedges are cast 1 in. wide by 6 in. long and are ½ in. thick at the base, tapering to 1/16 in. at the top. They are held upright under a small drop hammer shown in Fig. 2, and are repeatedly struck by this hammer until fracture commences. Each blow delivers 70 ft.-lb. of energy. The number of blows required to start fracture and the shortness of the uncurled portion of the wedge are taken as one means of measuring the strength and ductility of the iron.

The record of the following test conclusively proves the ductility of the core of a malleable casting. Several of the wedges as above described were cast of the standard width and length, but were made five-eighths inch thick at the base and three-sixteenths inch thick at the top. These wedges then had one-sixteenth inch machine off the 1 in. by 6 in. faces, leaving a wedge of the same dimensions as the unmachined standard wedge. Since the skin of a malleable casting is only about one thirty-second inch thick, the removal of one-sixteenth inch insured the removal of the skin. After machining, these wedges were put under the drop-hammer and subjected to the standard test. Their appearance after test was as shown in Fig. 3.

These results compared with tests made at the same time of unmachined wedges from the same furnace and annealed in the same oven are tabulated below:

	Unmachined wedges, blows.	Machined wedges, blows.
Afternoon heat, June 3	18.5	13.20
Afternoon heat, June 4	29.75	26.30
Afternoon heat, June 6	19.75	21.20
Average	22.67	20.27

It will be noted that the average result of the three tests of unmachined wedges is but slightly above that of the three

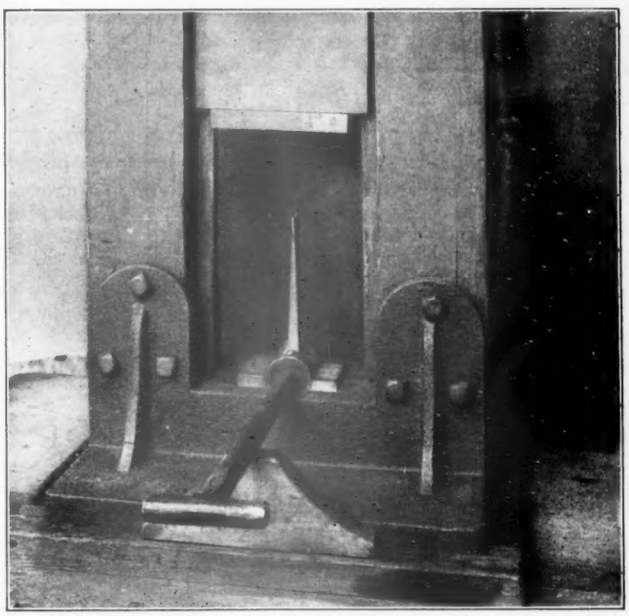


Fig. 2—Wedge Method of Testing the Ductility of Malleable Iron

tests of machined wedges, and in one case a machined wedge actually stood more blows than an unmachined wedge. Assuming this one case to be unusual and considering only the other comparative results, it is evident that malleable iron, even with its skin removed, is both ductile and dependable.

All parts of a malleable iron casting, even if the sections are as thick as 2 in., can be completely, thoroughly and uniformly annealed. The micrographs shown in Fig. 4 are illustrative of this fact. These micrographs show the typical

structure of first class malleable iron after anneal, the white areas being ferrite (pure iron) and the dark spots temper carbon. The structures shown range from the extreme edge to the exact center of a 2-in. section. It will be noted that the structure is practically the same in every case.

Heavy malleable iron castings are readily annealed, and insofar as this last step in the production of malleable iron is concerned, the process with heavy section castings is not different from that used with castings of light section. All that is required to anneal malleable iron castings is to raise them to a temperature at which the cementite and pearlite in the hard iron break down into ferrite (carbonless iron) and carbon, to give the action time to be completed and to cool slowly. It is obvious that a heavy section casting can be heated to the annealing temperature as readily as one of light section; for no matter how heavy a mass may be it can be heated throughout to any desired temperature if surrounded by a medium at that temperature for a sufficient time. The annealing of malleable iron requires about seven days, more than enough time for a heavy section to reach the temperature of its surroundings.

The annealing process, however, is not the one which alone controls the successful production of heavy malleable iron castings. An equally important factor is the foundryman's close adherence to the somewhat different procedure required in the production in the "hard iron" of castings of heavy section from that required for castings of light section. Regardless of thickness of section the prerequisite in making good malleable iron is to have practically all the carbon in the "hard" or "white iron" castings in the "combined" state. If carbon to any extent occurs there in the uncombined state the iron will be bad. Several factors tend to cause this condition; notably excessive carbon or silicon in the molten metal at time of pouring, and rate of cooling.

The rate of cooling has a very sensible influence on the appearance of "uncombined" carbon in the "white iron" castings; the slower the iron cools in the mold the greater the tendency for graphite to separate out. Obviously a casting 2 in. thick will cool much slower than one of 3/8-in. section. Consequently, in the manufacture of heavy-section castings the carbon or silicon, or both, in the molten metal must be lower than when light-section castings are made. This is taken care of by the operation of different furnaces

Fig. 3—Machined Malleable Iron Wedges Tested Under the Drop Hammer to Show the Ductility of the Core Metal

with different charges, suitable for very light work, medium weight work, or for very heavy castings.

Malleable iron castings cannot be over-annealed. It has been determined by very exhaustive tests that no marked deterioration in quality results if a casting is exposed to the proper annealing temperature for even four or five times the normal length of time of the anneal. This fact is evident from the appearance of the fractures shown in Fig. 5, which illustrate malleable iron that had been annealed from one to eight times. The strength and ductility of the iron showed no noticeable change until after the fifth anneal, and even then the deterioration was very slight. The illustrations of the fractures, made from ordinary photographs of the polished and etched sections indicate that after the second anneal a ring of pearlite appears, working steadily towards the center during each successive anneal. The structure on each side of this ring is still the free ferrite and carbon characteristic of superior malleable iron.

It is true that malleable iron castings can be burned, as can all iron and steel products if heated to too high a temperature, but in all malleable iron foundries deserving of the term "modern" the annealing ovens are equipped with an electric pyrometer with terminals at various points in the ovens. In this way the temperature throughout the ovens is accurately known at all times.

Malleable iron with a tensile strength of 38,000 lb. per sq. in. and an elongation of 5 per cent in 2 in. was considered satisfactory under the old methods. At the present time good malleable iron has an average tensile strength somewhat above 45,000 lb. per sq. in. and an average elongation of 8 per cent in 2 in., seldom falling below these values and frequently rising above them. That this statement is conservative and as indicative of what quality of malleable iron can be produced and is quite often produced

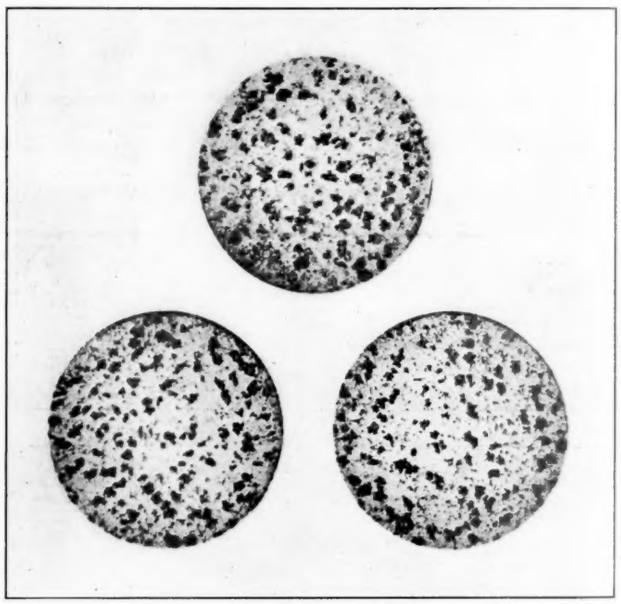


Fig. 4—Photo-Micrographs Showing the Structure, from the Edge to the Center, of a Malleable Iron Casting of Two-Inch Section

today, the following data, taken from a record book of one of the association's foundries, show 16 consecutive heats from one furnace:

Heat	Tensile strength, lb. per sq. in.	Per cent elongation in 2 in.
November 1, A. M.	53,800	10.91
November 1, P. M.	57,300	10.51
November 2, A. M.	56,100	11.71
November 2, P. M.	54,400	12.50
November 3, A. M.	55,800	12.50
November 3, P. M.	54,100	11.71
November 4, A. M.	54,100	11.73
November 4, P. M.	53,800	10.95
November 5, A. M.	56,100	14.09
November 5, P. M.	60,000	14.05
November 6, A. M.	52,100	7.89
November 6, P. M.	54,100	10.90
November 8, A. M.	55,400	9.37
November 8, P. M.	55,100	10.89
November 9, A. M.	57,700	9.42
November 9, P. M.	55,400	14.09
Average	55,300	11.45

The Associated Manufacturers of Malleable Iron have recently voluntarily adopted a specification for railroad malleable iron castings, applying to the product of some 30 member companies, embodying a minimum tensile strength of 45,000 lb. per sq. in. and a minimum elongation of 7½

per cent in 2 in. This specification they will offer to all purchasers of such castings and agree that their product shall be accepted or rejected on this basis.

Assertions are still frequently made that malleable iron is unreliable due to non-uniformity in methods of manufacture and other defects inherent in this metal. This was doubtless true of the product as a whole made some years ago, and may still be true of iron made by those manufacturers who have not kept abreast with recent developments, but it does not apply to malleable iron produced by the Associated Manufacturers of Malleable Iron. This association, comprising a large number of malleable iron manufacturers in this country, has had in its employ for some time metallurgical experts who have by patient research insured the production of an iron which is ductile, strong and uniform in quality. The three means of investigation made use of by these experts, and in continued use, are the chemical laboratory, the physical laboratory and photo micrography. Standards of procedure adopted by and compulsory with members of this association may be briefly described as follows:

After the castings are poured an analysis is made to disclose any irregularity in furnace operation and to give assurance that the desired composition of the iron is obtained. At the same time necessary test bars are cast from each heat to be used to determine the tensile strength, transverse strength and ductility. These test bars are distributed at different points in the oven in which the castings from this heat are annealed. After the castings, test bars and wedges have been annealed the bars and wedges are tested. Each one must come up to a certain standard before the castings are considered fit for service. If any bar fails to meet this standard, sections are cut from the casting, examined under the microscope, and the cause of the failure thus ascertained.

The following statement appears on page 13 of the 1914 report of the M. C. B. Committee on Car Construction:

"Malleable iron varies greatly in quality and is generally inferior to cast iron under loads subjecting it to pure compression. It is ductile, and has ability to resist shocks without cracking, which makes it superior to cast iron for car details not subjected to high tension or bending strains. It is greatly inferior to cast steel in strength and ductility. It should not be used subject to high tension or bending strains, unless a breakage will not involve danger or damage to other parts of the car."

This statement, while without question made in good faith at the time of this report, if now reviewed by the same committee members would doubtless be considerably modified, but it unfortunately stands on record as part of the last published report of an M. C. B. Committee on Car Construction. The assertions made, with one exception, do not now apply, are misleading, and where seriously entertained by those not in touch with the great improvement in quality of malleable iron, are preventive of considerable economy in car and truck construction due to the unnecessary use in many cases of cast steel car members instead of the less expensive malleable iron parts.

With respect to the stated inferiority of malleable iron to cast iron "under loads subjecting it to pure compression," this reiteration of a well known fact is superfluous, as the comparison made applies with equal force to all ductile steel products, and further, with the exception of wheels the inability of cast iron to resist shocks should eliminate its use on freight cars.

It will be noted from the above quoted statement, that "malleable iron is greatly inferior to cast steel in strength and ductility," and further, "It should not be used subject to high tension or bending strains unless breakage will not involve danger or damage to other parts of the car." Comparing malleable iron as produced today with cast steel, the actual facts as proved by tests at once controvert this opinion and recommendation.

In testing a cast steel rod having an ultimate strength of 65,000 lb. per sq. in., the elastic limit was reached at 32,200 lb. per sq. in. A malleable iron bar, having an ultimate strength of 53,500 lb. per sq. in. under tensile test, showed an elastic limit of 38,500 lb. Thus the elastic limit of the malleable iron bar was 9.38 per cent higher than that of the cast steel bar. It would seem hardly necessary to emphasize the advantage of this particular characteristic of malleable iron when it is recalled that the elastic limit and not the ultimate strength is used by engineers as the proper basis in designing castings. Despite the high ratio of elastic limit to ultimate strength, the unquestionable ductility of malleable iron is proved by the wedge tests as above described and illustrated, and by the figures given for percentage of elongation.

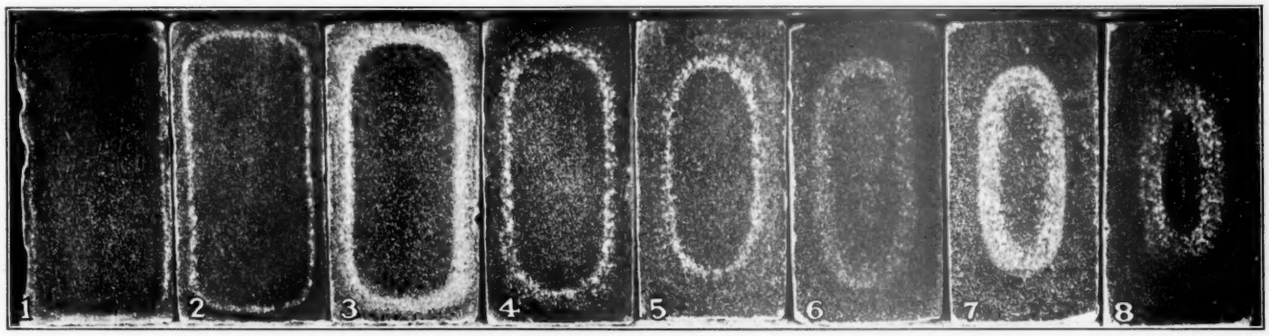


Fig. 5—Photographs of Polished and Etched Fractures Showing the Effect of Successive Annealings on Malleable Iron

The not infrequent failure of steel castings due to interior flaws which cannot be detected by surface inspection is a matter of common knowledge. Examination of steel castings which have failed in service will in almost every instance disclose flaws in the core of the casting which were not in any way apparent on the exterior surfaces.

Malleable iron shrinks and cracks less than cast steel, and very rarely contains blow holes. This is because malleable iron castings are poured at a lower temperature than steel castings. The higher the temperature to which a metal is heated the more gas it takes up, with resultant greater liability to blow holes. Likewise the higher the temperature of the molten metal the more rapid its rate of cooling in the mold, with resultant tendency to shrinkage, flaws and cracks.

Much of the adverse opinion concerning malleable iron is due to the misconception as to its adaptability to heavy as well as light-section castings and lack of co-operation between designer and manufacturer. An engineer, with the erroneous belief that it will not do to design a malleable iron

casting with sections in excess of ½ in. in thickness, has his attention called to such castings in service failing in considerable number, and forthwith decides on the substitution of a steel casting of such increased thickness as to weigh 60 to 100 per cent more than the malleable iron casting which it replaces. Had only a part of this additional metal been put into a properly redesigned malleable iron casting, equal or better results would have been obtained with less dead weight and less expense. Again, an engineer without precise knowledge of the peculiarities of malleable iron designs a car casting in such a way as to cause hidden shrink cracks and internal strains sufficient to result in a large percentage of failure in service. Experience has demonstrated that by intelligent co-operation with the foundryman developments of this character are entirely avoidable. The malleable iron manufacturer knows his metal. With this knowledge he is well informed how best to design any given pattern so that unequal shrinkage in the component parts of the casting made from it will not occur; thus affording maximum strength for a given weight. While he may not be fully informed as to just what is required in service of a certain part, he knows that failure because of structural defects, at once apparent to the experienced malleable iron foundryman, can be avoided by making the casting a little thicker here, a little thinner there, bracketing at one place and altering at another.

Freight equipment draft gear and attachments are admittedly subjected to greater abuse in service than any other car members. Modern friction draft gears and many of the draft attachment parts have always been and are still made of malleable iron, and yet it is a matter of record that the percentage of failure of these malleable iron parts of friction draft gears and draft attachments is not greater than that of the steel couplers. As a matter of fact, malleable iron draft castings can be and are designed so as to make them proof against failure in the severest kind of service.

The writer submits that malleable iron as produced today by reputable manufacturers is on the whole just as dependable as cast steel, comparing the two metals in castings of the same thickness of sections and of length not over six feet. The truth of this statement, in view of the lower cost of the malleable iron casting, should merit the careful investigation of those engaged in the design and maintenance of freight cars.

GERMAN RAILWAY RESTRICTIONS.—References have recently appeared in our columns and those of the daily press relating to the growth of transport difficulties on the German railways. The latest official document on the subject available enumerates a series of drastic restrictions. To begin with, it is laid down that cars must be loaded and unloaded with all possible speed, and that work must proceed by day and night, including Sundays and all public holidays. The military authorities are given powers regarding the employment of soldiers and civilians when the railway staff is inadequate, and the necessity for quick unloading is especially urged on the owners of private sidings. Consignees are not to ask for cars unless they can be loaded in the time officially specified, and it is further provided that "no merchandise should be despatched unless the possibility of unloading is assured beforehand." Consignees handling large quantities of merchandise are required to give the railway authorities advance information of expected deliveries, and in order to avoid unnecessarily long journeys buyers of all commodities are requested to make their purchases at the nearest possible centre to the place of destination. Another regulation provides that "every despatch which is not indispensable should be avoided." These regulations followed on certain passenger traffic restrictions, which have since been added too.—*Railway Gazette, London.*

NEW HAVEN BUILDING LARGEST NEW ENGLAND FREIGHT YARD

The New York, New Haven and Hartford has started work on a new classification yard at Montowese, Conn., near New Haven, which, when completed, will be the largest and most complete in New England, and in comparison with the character and volume of business handled, it will rank with the great railroad yards of the country. The plans for the new yard have been drawn with the idea of increasing and improving the service of the New Haven and to provide the facilities for handling the peak load at all times without delay or congestion.

The new classification yard is to be located near New Haven because of the relative importance of that city to the whole New Haven system. It is similar to the hub of a wheel. Important lines radiate from New Haven to New York; to the west over the Poughkeepsie bridge route; to Waterbury and Winsted; via the canal line to Holyoke, Northampton and other points; to Hartford and Springfield; via the air line to Middletown, Willimantic and points in the northeast; and over the low grades of the shore line to New London, Providence and Boston, and other points in Rhode Island and eastern Massachusetts. The essential purpose of the classification yard will be to receive trains from all routes made up of cars for all destinations. In the yard the cars will be sorted out and made up into trains for their proper destination. All trains will leave the yard in station order for all the important destinations, many of them being straight made up trains for each of the more important commercial centres.

The yard will be of the hump type. There will be two distinct sections, one for eastbound and northbound traffic, and the other for south and westbound traffic. Each section will have three units. The first will be the receiving yard into which arriving trains pull in. The tracks in this yard will practically eliminate the standing of freight trains in the cuts and on the main line, both east and west of the New Haven station. It will also prevent delay to freight trains at other points in the vicinity of New Haven. The next unit is the classification yard. There will be about 25 tracks in the east and northbound unit and 15 in the west and southbound. They will be short tracks into which cars will be delivered by cutting them off at the hump and letting them drop into the various tracks by gravity. Each track in these two classification units will represent a single classification. The third unit is the departure yard. After being classified the cars are switched into this yard from the classification yard and are made up into trains.

A 16-stall roundhouse and a large merchandise transfer that will hold three or four hundred cars will be included in the layout. The plans for the new yard provide for the separation of grades at Air Line junction, where the westbound shore line passenger trains will be carried overhead all the tracks. The freight will pass underneath in the middle and the northbound passenger line will pass underneath and around the east side of the yard. Under this arrangement through passenger and through freight trains will not cross each other at any point at or in the vicinity of New Haven. In a similar manner, the freight tracks leaving the shore line east of the junction will be separated from the grade of the westbound passenger track.

The New Haven, in anticipation of this improvement, purchased nearly all the property required some time ago. At the present time five steam shovels are in operation and it is hoped to have a few of the tracks of the first unit completed within three months.

FRENCH LIGHT RAILWAYS.—France has a much greater mileage of light and secondary railways than is generally imagined, one company alone operating 1,366 miles.

Full Cars Are Essential for Train Loading*

Five Discussions Which Point Out Some of the Basic Principles Underlying the Securing of Heavier Tonnage

THE first essential to a heavy train load is fully loaded cars. In the discussions of means of increasing the train load printed below several of the authors emphasize this and other primary factors which must be considered in a campaign of this kind.

SOME PRACTICAL ILLUSTRATIONS

By W. Wilson
Assistant Superintendent, Southern Pacific, Portland, Ore.

Train loading, engine efficiency and train miles are in the hands primarily of three men: the chief despatcher, engineer and yardmaster. The average yardmaster is ambitious to keep his track clear and in doing so frequently overlooks the importance of a full train load. On a certain division the engine rating is 2,000 tons. Two trains are due to arrive a few hours apart. The first has 1,750 tons, the second 2,250 tons. In order to save a few minutes' work, the yardmaster runs the first train on arrival, 250 tons light, and the second train on arrival, reducing it 250 tons. If the first train had been made up and the 250 tons from the second train added, the delay would have been nominal and all tonnage would have been moved, securing 100 per cent engine efficiency with a full train load on both trains.

In figuring tonnage it often happens that to add one load to a train would make it ten tons over the engine rating. Instead of adding a 20 ton load, the yardmaster lets the train go out ten tons light. By doing this he has lost 20 tons, or one per cent on the train load and one-half of one per cent on engine efficiency or he has lost one train in 100 trains.

On a 700-mile division, of which the first 250 miles is on easy grades, two trains of fruit are moving; the first on time, the second three or four hours late. The first should be run with 90 per cent of the engine rating and be kept on time, and the second with 70 per cent of the engine rating to enable it to close up on the first at the end of the 250-mile run and be consolidated with it, filled to 90 per cent of the engine rating and so run for a distance of 250 miles, or over the various grades, furnishing the necessary helper engines that are adapted to such grades. This class of helper engines should be located at the different helper stations to handle the tonnage in the train, and at the same time correspond with the engine rating. With proper train despatching this train will have gained 30 min. to 1 hr., putting it that much ahead of time, leaving, say 200 miles of easy grade to be run, over which full tonnage and 100 per cent engine efficiency could be maintained.

On some divisions local freight trains make the division in six to eight hours, handling only a few cars. They should be filled to tonnage that will enable them to make the division in eight or ten hours.

In a large commercial center, several roads are competing for early morning delivery of merchandise at intermediate points. The time is very fast, making it necessary to handle a light train load. As a rule it is not essential to deliver Saturday's loading until Monday morning and Sunday's loading is very light, if any. On Saturday and Sunday these trains should be filled to full tonnage. A train including ten cars of bananas arriving at Chicago at 6 p. m., Saturday, for Monday morning delivery, would be time thrown away. Some of this time should be consumed on the last 300 or 400 miles of the run for handling tonnage.

Chief despatchers have been known to run several sections of fast freight trains a few minutes apart over long divisions, and in the prevailing direction of traffic, some of the sections gaining several hours and being delivered to the connection several hours ahead of time. By proper supervision on the part of the chief despatcher, this time should have been used to haul full tonnage or to consolidate some of the sections, which would ultimately result in the saving of several trains.

Most engine ratings are made by the mechanical department, and the result is that our engines are underrated. While we make a good showing in engine efficiency we are losing in train load as against what our engine can actually handle.

It is not necessary to run test trains in order to arrive at what an engine can haul, or to figure engine ratings mathematically except to attain a fair rating. The proper way to test an engine to determine what it can haul is to add a load or two until you have gotten it where it will handle every pound possible of dead freight at a speed of 12 miles per hour over a freight district.

On a certain division the largest number of cars of perishable freight that had ever been handled in any one train was 50 cars. The connecting division delivered 60 cars of perishable freight on short notice. There was nothing to fill out with in order to run two trains. The chief despatcher, knowing the engineer, instructed the yardmaster to let the 60 cars go in the one train, stating "Russell will handle them." He did and made the schedule, and from that time on, with the same class of engine, 60 cars of perishable freight has been the maximum. In fixing such schedules the chief despatcher should take into consideration all conditions, including the number of trains to be met and passed, the weather, slow orders at the foot of short grades, whether the train consists of heavy or light loads, or mixed loads and empties.

LOADING TRAINS FOR THROUGH MOVEMENT

By H. S. Noble
Office of Division Superintendent, Pennsylvania Railroad, Erie, Pa.

On certain portions of a railroad there are usually a number of junction points where cars are interchanged, and also, on account of variable grades, numerous locomotive ratings have been established between local points. To operate such divisions by endeavoring to pick up and set off cars to suit the grades, will result almost invariably in a reduced train load. Theoretically it would appear that the maximum average train load is obtained by loading locomotives to their maximum rating between interchange points. In actual practice, however, a congestion will form at some outlying point where cars have been set off on account of encountering heavier grades, and it will become necessary to run an engine and crew light to the point of congestion to clear up the accumulation. The light locomotive mileage made in this operation increases the total mileage to the extent that the train load invariably falls off in proportion to the number of times the train master permits tonnage to accumulate at the outlying points. To overcome those difficulties through tonnage ratings with proper helping service on the grades will have the effect of increasing the average train load and incidentally reduce the coal consumption, overtime and drawhead failures.

On one division the writer found trains being operated

*Other papers received in the contest on Methods of Increasing the Train Load were published in the issues of June 22, page 1401; July 13, page 63, and August 3, page 201.

on the local tonnage basis, and owing to the heavy business and considerable overtime which was being made a heavier class of power of the superheater type was substituted in place of the smaller engines. Comparative records were kept to indicate the advantages of the heavier engines, during which time the old basis of setting off and picking up cars was practiced; this resulted in an increased train load of only 8.5 per cent. At the same time the overtime decreased 13.7 per cent and the coal consumption decreased 12.8 per cent. By the application of through tonnage ratings and the establishing of one regular pickup train each day, the train load was increased 21 per cent, the overtime decreased 68 per cent and the coal consumption reduced 27.4 per cent as compared with the corresponding period when the smaller power was used.

Temperature Reduction

On account of the fall in temperature during winter months, a reduction in the tonnage of freight trains must be made in order to produce a total resistance of the train equal to the power of the locomotive. No definite dynamometer car figures have been produced to show accurately the proper reduction to make in order to meet the various low temperatures. However, the following table indicates the percentage reductions that can be made for various grades, according to the amount of increased resistance due to fall in temperature.

Table Showing Temperature Reductions

Symbol	Pounds increment in resistance	Per Cent Reduction in Tonnage		
		0.3 Per Cent Grade	1 Per Cent Grade	1.5 Per Cent Grade
A	0	0	0	0
B	1	8.1	4.8	2.8
C	2	18.7	8.5	5.7
D	3	25.2	11.5	8.3
E	4	30.7	14.8	10.8
F	5	35.7	17.8	13.1
G	6	40.0	20.7	15.4
H	7	43.7	23.3	17.5
I	8	47.0	25.8	19.5
J	9	50.0	28.2	21.4

In applying the reductions on a division where at one terminal the grade is 0.3 per cent, and at the opposite terminal 1.5 per cent, it will be noticed that the reduction on the heavier grade is much less than that on the lighter grade. From observations noted on various railroads, the percentage reduction made for a given division is uniform and therefore no consideration is given to the smaller reductions necessary on heavy grades. In actual operation it has been found that where the temperature was about 15 deg. below zero, that 50 per cent reduction was found necessary on a 0.3 per cent grade, while on a 1.5 per cent grade only 25 per cent reduction was necessary for the same temperature. As the former ratings used on the division in question carried a flat reduction of 50 per cent for a temperature of 15 deg. below zero, it is evident that an increased trainload of 25 per cent is obtained through the use of the above table.

HOW THE ILLINOIS CENTRAL MADE PROGRESS

By O. O. Carr

Statistician, Office of General Superintendent of Transportation, Illinois Central, Chicago.

The revenue train load on the Illinois Central for 1916 was 550 tons, an increase of 182 tons over 1912, or 49 per cent in four years. About 6.4 per cent of this increase was accomplished by the greater tractive power of locomotives, about 1 per cent by grade reduction, and the balance by reducing the empty car mileage in the direction of the full train load, increasing the car load by heavier loading and increased car capacity, increasing the tonnage rating of locomotives by the equated method, rerouting fast freight trains to avoid three operating districts having unfavorable grade conditions, and by close supervision.

The supervision has been improved by a system of daily tonnage reports compiled in the superintendent's office and distributed to the chief despatcher, train masters, traveling engineers and others concerned, showing the per cent of the full engine rating handled by each train, the total for the trains run that day and the total for the month to date compared with previous periods. The data are taken from conductors' wheel reports. The work of compiling mileage and tonnage statistics from wheel reports has been transferred from the office of the car accountant to that of the superintendent in order to have the comparative train tonnage data available daily.

In addition to the daily check kept on each division, monthly graphic charts are distributed from the office of the general superintendent of transportation showing comparatively by months the gross and net train load in the direction of heavy traffic and in both directions, the car load, the percent of loaded cars to the total and the car miles in the direction of heavy traffic and in both directions.

The principal increase in train load was accomplished by adding tonnage to the trains handling the heavily loaded cars, as under the single rating for all lengths of trains, the short trains were underloaded.

KEEPING EVERLASTINGLY AT IT

By J. L. Coss

Despatcher, Chicago, Rock Island & Pacific, Haileyville, Okla.

The problem of increasing the train load where the tonnage fluctuates rapidly and where many connections that interchange cars are located is a serious one. However, the fact that tonnage can be increased under these conditions has been demonstrated on the Indian Territory division of the Rock Island. There are 12 interchange stations on this division of 353 miles. These, in connection with local stock pick-up trains, long trains of empties in one direction and short trains of coal in the other, the bulk of the tonnage eastbound for a part of the month and westbound for the remainder, require a constant study of transportation matters to keep the train load normal, to say nothing of increasing it.

In the latter part of 1912 the average gross tons per freight train, which included three mixed runs on branch lines, was 1,025, while in August, 1916, it had reached 1,240, an increase of 215 tons per train, or 20.9 per cent. This was accomplished little by little during the intervening time with the same engines, with the exception of six which were converted into superheaters and delivered to this division at intervals of approximately 30 to 60 days. The superheater engines are capable of handling from 160 to 200 tons, or about 10 per cent more than the other engines.

From 12 to 18 engines, including the superheaters and small engines on the branches, are generally used on this division to handle the traffic. Local trains handle full tonnage in the direction of heavy traffic over the division.

Trains doubled over the line where the physical condition permitted and turn-around runs were handled in order to place tonnage for local trains that carry short cars for trains which were expected to pick up stock but which failed to load for various reasons and for trains that set out cars short of destination on account of their becoming bad order.

Agents have been cautioned repeatedly to see that cars are loaded to capacity and frequent checks are made with a view of correcting any errors in light loading. During the cotton loading season if an agent has 10 or 15 bales to load for the compress he loads them in a car and the car is then moved to some other station where a similar amount is loaded in the car, thereby avoiding light loading of cars in the direction of the compress. The mechanical department is pressed continually to keep the engines in good shape to handle the tonnage and the attention of the car department

frequently is called to the importance of seeing that boxes are well oiled and packed and brakes properly adjusted to prevent their sticking.

The roadmasters and bridge and section foremen are required to see that all bad track and bridges on which slow orders are placed temporarily are repaired as soon as possible and that no time is lost in reporting the repairs to the despatchers' office in order that the restrictions can be taken off, thereby possibly preventing a train stalling and making the consequent reduction in the train load. The despatchers take personal pride in seeing that the train is put on the side track that can get out of the siding most readily at meeting points and also to locate meeting and passing points with the least stopping of trains, all of which works to the advantage of the heavy trains. Agents are required to report to the chief despatcher's office the moment loads are ready to move and when received from connecting lines in order that such cars can be figured on to fill trains that might have short or disabled cars.

The tonnage handled by conductors is frequently checked with the way bills at the end of trips to ascertain if they are handling the tonnage reported on their register slips and if the result reveals a light discrepancy the conductor is required to make an explanation.

When for any reason an engine fails to handle its rating, an immediate explanation is due from the engineer. The matter is not allowed to drag along until perhaps forgotten, but it must be investigated at once by the trainmaster and a representative of the mechanical department and a suitable explanation made.

In brief, the fundamental reason for this increase in train load is the diligent methods pursued day after day. The subject is not taken up one day and then allowed to lie dormant for a week or so, but it is pursued daily without any let up.

OTHER PRACTICAL SUGGESTIONS

Two Handicaps.—There are today entirely too many small classification yards in which a maximum train load cannot be approximated with a reasonable amount of switching. First of all, the territory to which heavy classification falls must be analyzed carefully. No classification yard is in a position to give a full train load unless it is sufficiently well junctioned, and its capacity great enough to accommodate the in-going and out-going movement of the maximum tonnage accruing to that territory.

During the days of active solicitation the railroads and shippers interested are inclined to establish specific train numbers or symbols, to protect the business of a certain district by exceptionally fast movement and prompt delivery. Many trains were operated in this way that were not necessary at the beginning or today. If a train was of a certain symbol it sometimes carried 25 cars or less, because there were no more ready at the scheduled time that contained the class commodity that this symbol or train was to carry, yet there were many cars for the same destination or classification that might have been despatched on the same schedule without delaying it, the only exception being that they carried another class commodity.—*A. E. Aumiller, Chief Clerk to Freight Agent, Pennsylvania Railroad, Harrisburg, Pa.*

Supervision.—Intelligent supervision and persistent action are necessary requisites in the successful prosecution of any scheme. The secret of increased train loading is nothing more nor less than the secret of concentration and intensified action. The responsibility for increasing the train load with existing facilities rests with the division superintendent and his subordinates. Enthusiasm, efficiency and activity should not begin with the despatcher and go up to the superintendent, but should begin with the superintendent and permeate down through his organization. If the superintendent is not personally efficient and active, he can not expect his subordinates to be. The superintendent should keep up enthusiasm by his constant activity; he should know from day to day the tonnage his trains are handling.—*H. E. McGee, Superintendent, Missouri, Kansas & Texas, Greenville, Tex.*

Avoid Car Delays.—In their zeal for increased tonnage, operating officers should not lose sight of the fact that the average car detention is increased. Holding a train for an hour or two in order to fill out may result in the failure to unload 50 more or less per diem days upon your neighbor, which is quite an item at the present time. In order to obtain maximum efficiency from the cars available, they should be given a maximum load promptly and then moved with despatch. An idle car should be viewed with alarm. The operating officer should keep before him the figures showing the average detention to foreign cars for each month and focus his energy on reducing them. It behooves all railroads at the present time to handle all cars with the least possible detention, to help alleviate the serious car shortage. Maximum tonnage is commendable as evidenced by the visible saving, but at the same time let us keep an eagle eye on the lookout for a possible invisible loss.—*W. S. Hanley, Superintendent of the New Orleans Great Northern, Bogalusa, La.*

Car Efficiency.—The present car shortage forces upon us the question of car efficiency. It has been said that if all cars used were fully loaded over a million cars could be released from service. This may exaggerate, but it is the firm belief of many that the present number of freight cars is sufficient provided they were kept busy, both as to movement and loading efficiency.

If fewer cars can be made to do the work, operating expenses will decrease. In moving grain from its lake port to the seaboard one railroad made an examination of the car axles on its 80,000 lb. capacity cars last year and found they would safely carry 94,000 lb. It loaded these cars with an average of 1,563 bushels, or 93,803 lb., and on a total movement of 17,769,391 bushels of wheat saved the use of 750 cars and a haulage of dead tare of over 9,000,000 ton miles. There was not a single accident due to the cars carrying the excess tonnage, although the total car miles plans for increasing railroad revenues. Whenever car earnings can be increased without increasing the rate per hundred was about 4,700,000.

Another way in which fewer cars may be made to do the same service is by increasing the minimum weights. To shippers this seems the least objectionable of the various pounds no one is injured and great economy is practiced. It is a fact today that minimum loads oftentimes do not fill one-half the cubical or weight capacities of a car. While it is true that the carriers in some instances might utilize the unused space in such cars for less carload freight, it is not ordinarily done, and there are many reasons why it is not a good thing to do. Roads with long hauls can doubtless use some of this space, but it is not a common practice.—*Geo. C. Conn, Freight Traffic Manager, Pere Marquette, Detroit, Mich.*

PIG IRON PRODUCTION IN 1917.—In the first half of 1917 the United States produced 19,258,235 tons of pig iron, comparing with 19,619,522 tons in the first half of 1916, and 19,815,275 tons in the second half of 1916.—*Bulletin of the American Iron and Steel Institute.*

CARS FOR PASSENGERS WITH BULKY PARCELS.—The 1916 report of the Metropolitan, the Paris underground railway, mentions that a number of second-class compartments without seats are now in use, for the special convenience of passengers with bulky parcels. The results of this experiment should be of interest in other large centers of population.

INCREASED LOADING OF FRUITS AND VEGETABLES

The Commission on Car Service has issued Car Utility Bulletin No. 2, addressed to shippers and receivers, pointing out ways in which the car loading of fruits and vegetables may be increased and showing that increased car loading will help eliminate the car shortage. The bulletin states that the ability of carriers to move the crops depends upon the co-operation of shippers in the full loading of cars and then gives plans illustrating how cars may be loaded to capacity with potatoes, cucumbers, tomatoes, onions, cabbages, beets, oranges, grape fruit, lemons, watermelons and apples, together with photographs showing how the contents of a car are frequently damaged when a car is not loaded full. One page of the bulletin gives suggestions for relieving freight congestion as follows:

"The demand for freight cars at the present time is far beyond that of any previous period in our history. When our troops are actually in the field this demand will be greatly increased. The following suggestions for relieving car shortage and freight congestions are recommended to the attention of shippers and receivers of merchandise:

"1. Unload promptly all loaded cars received.

"2. Load promptly all outgoing cars and release them immediately to the railroad.

"3. Anticipate disposition of freight before its arrival.

"4. Do not order specimen types of cars when ordinary types will serve.

"5. Eliminate use of railway equipment in trap or transfer service when tonnage can be handled by motor truck or wagon.

"6. Load all cars to their full carrying capacity, (110 per cent marked capacity) or cubical capacity, so that maximum use of each car will be obtained. This can be accomplished by:

(a) more careful supervision of loading;

(b) producers and buyers agreeing to disregard established trade units and increase the units as a war measure;

(c) waiving rights in regard to minimum weights under tariff and traffic regulations;

(d) buyers increasing their orders so as to fill the car, and producers disposing of their output on a basis of full carrying capacity of equipment furnished;

(e) buyers who cannot handle larger quantities clubbing together with other buyers to make full capacity cars;

(f) showing customers who desire, merely as a matter of convenience, smaller units than maximum how they can help the general situation by enduring inconvenience.

"(7) Load freight requiring refrigeration to the safe carrying capacity for the commodity loaded.

"(8) Load freight requiring ventilation to the safe carrying capacity for the commodity loaded, but understand that this class of freight can be loaded much heavier than freight requiring refrigeration, although not always to the full visible capacity.

"By more intensive loading, there will be a reduction in the number of cars under load, which will particularly relieve congested territory, where it is a question of track room rather than of equipment, so that business can and will be handled more promptly. Cars detained by congestion will thereby be relieved, and since congestion exists in the great consuming centers a reduction in the number of cars under load will result in better equalization of equipment throughout the country.

"In all cases keep the cars moving with a full load and settle differences of opinion afterwards.

"NOTE:—This Bulletin has the approval of the United State Department of Agriculture, together with a number of leading railroads.

"Mr. Shipper, Mr. Wholesaler and Mr. Distributor, there is already an acute car shortage. This car shortage can be greatly reduced if you will make better use of car space.

"EFFICIENCY IS AS NECESSARY AS PATRIOTISM.
"WE ARE SURE OF YOUR PATRIOTISM.
"WE MUST HAVE YOUR EFFICIENCY."

USE AND ABUSE OF STATIONERY AND OFFICE SUPPLIES*

By M. K. Barnum
Assistant to Vice-president of Operation and Maintenance, Baltimore & Ohio

The fact that the Baltimore & Ohio spent about $410,000 for stationery and printing during 1916 shows the possibility of large savings in the ordering and use of stationery and small office supplies. The amount does not include typewriters, computing machines, tickets, passenger and freight tariffs, time-tables, etc.

As an illustration of the large cost of small items used in quantities, the stationer sent out 8,300 lb. of common pins, valued at $5,677.65 during 1916.

Some of the other small articles which were furnished in large quantities, were the following:

611,159	pencils	498,264	pens
13,494	rubber stamps	11,500	sponges
18,537,620	envelopes	3,912,310	sheets of carbon
22,807,100	second sheets	10,104	pen holders
70,000	thumb tacks	2,615,600	file backs
421,000	blotters	3,924	message hooks
33,264	rubber erasers	10,620,730	rubber bands
2,487,000	McGill fasteners	900,720	clip fasteners

As an example of the lack of care used in some offices in making up stationery requisitions, one division superintendent's office recently ordered over 2,000 lead pencils for a 60 days' supply, although other offices on the division made separate requisitions for their own supply of pencils.

The following are among the bad practices in the use of stationery:

1. Cutting up printed blanks in current use for scribbling paper, instead of ordering pads.

2. Use of a large envelope where a small one will serve; also, not enclosing in one envelope as many communications as possible.

3. Discarding sponges instead of washing and re-using them.

4. Discarding carbon paper which is still serviceable.

5. Throwing rubber bands, pins, and fasteners into the waste basket which tends to reduce the value of the waste paper when sold, in addition to the loss of the bands, pins and fasteners.

6. Allowing the stationery to become scattered and soiled.

A few suggestions in the use of stationery are:

1. Carefully check supplies on hand before making requisition.

2. Have requisitions made up by some one with sufficient experience and responsibility to insure the correct amounts.

3. Return at intervals to the stationer at Baltimore, all surplus or obsolete forms on hand.

4. Save all waste paper and report accumulation.

5. Check over the records, correspondence, old catalogs, etc., and arrange for scrapping those which it is not necessary to keep.

It is estimated that from $40,000 to $50,000 a year can be saved by a general observance of the foregoing suggestions.

* Abstract of an article from the Baltimore & Ohio Employees' Magazine.

Judge Lovett Appointed Priority Director

Coal Given Preference for Northwest; Remarkable Operating Results in June; New Tariffs Filed in a Hurry

WASHINGTON, D. C., August 21, 1917.

ROBERT S. LOVETT, chairman of the executive committee of the Union Pacific and member of the War Industries Board of the Council of National Defense, in charge of priority, has been designated by the President as administrative officer under the provisions of the priority of shipments law, which authorizes the President, during the war, if he finds it necessary for the national defense and security, to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security shall have preference or priority in transportation by any common carrier. Judge Lovett came to Washington shortly after the war was declared to offer his services and was appointed chairman of a committee of the Red Cross. Recently he was appointed a member of the new War Industries Board and given jurisdiction in particular over questions as to priority in manufacture. With his new appointment his function will be to determine the relative importance of various kinds of commodities to the work of winning the war, to the end that the articles and materials most essential shall be given precedence in both production and distribution over others less important to the national interest.

R. S. Lovett

PRIORITY FOR COAL FOR NORTHWEST

The need for such an authority had been especially emphasized recently by the situation as to coal shipments across the lakes to the northwest and Judge Lovett's first official act after his appointment was the issuance of an order on Monday directed to 46 roads engaged in the transportation of bituminous coal to Lake Erie ports directing them until further order "daily to give preference and priority in the distribution of cars to coal mines served by them" and to transport the same so that bituminous coal for transshipment by vessel to ports on Lake Superior and Lake Michigan shall have preference and priority. The lake carriers were also ordered to accept and receive all cargoes of such coal tendered to them for shipment and to so load, transport and deliver them that it shall have preference and priority in transportation.

The order stated that "it has been made to appear, and the President through the undersigned finds, that under present conditions and volume of shipment, sufficient bituminous coal will not be transported via lake movement to Lake Superior and Lake Michigan ports before the close of navigation to supply the requirements of the territory contiguous thereto, which is necessarily dependent upon movement by lake for supply of bituminous coal, and that an adequate supply of bituminous coal in that territory is necessary to the national defense and security, and that a condition exists requiring the exercise of the powers vested in the President" by the aforesaid act of Congress and conferred by the President upon Judge Lovett.

The fact that an adequate supply of coal has not been moving across the lakes, although it is said that ore boats loaded from the upper ports have in many cases returned empty, has been giving great concern for some time to the people of the northwest, the railroads, the Committee on Coal Production and the governmental authorities. Members of Congress from the northwestern states have been agitating the question for some time both in Congress and at the White House and the Committee on Coal Production, the Commission on Car Service and the Interstate Commerce Commission have all given much attention to the situation. The consensus of opinion seems to be that the railroads have done everything in their power to move the coal but they have had no way of compelling shippers to use the cars furnished them to send the coal in the desired direction and many of the coal operators have preferred to ship elsewhere. It has also been said that the buyers in the northwest had delayed placing orders in the hope that coal prices would be further reduced.

At a meeting of representatives of the coal interests, the railroads and the Interstate Commerce Commission last week a resolution was adopted expressing the sense of the meeting that the situation could only be met by orders requiring coal operators in the Pittsburgh, Fairmont and No. 8 Ohio districts to ship at least 50 per cent. of the cars furnished to their mines to the lake ports for transshipment. After this meeting further conferences were held with the Railroads' War Board and a committee composed of Daniel Willard, Howard Elliott, and G. L. Peck, F. S. Peabody, chairman to the Committee on Coal Production, and A. G. Gutheim, of the Division of Car Service of the Interstate Commerce Commission, was appointed to make a tentative draft of a priority order. The definite order was issued by Judge Lovett after a conference with the President on Monday.

STATEMENT BY HOWARD ELLIOTT

On Saturday the Railroads' War Board had issued a statement that in order to meet the exigencies of the situation in the northwest the roads had appealed to the national government to make use of the powers conferred by the priority law to force the movement of coal across the lakes before the closing of navigation. The entire situation was explained in

a memorandum filed by Howard Elliott, which showed that the Railroads' War Board had been giving continuous attention to the subject since its organization, that on April 26 the roads were ordered to give preference to the movement of coal and iron ore and to confine the use of open top cars to this business so far as was reasonably practicable. As a result of this order, it was shown, the total number of cars of coal loaded and moved by the railroads in the United States has been as follows:

	1916	1917	Increase	Percent
May	692,316	876,591	184,275	26.6
June	899,378	1,146,334	246,956	27.5
July	658,200	862,026	203,826	30.9
Total	2,249,894	2,884,951	635,057	28.2

At 50 tons to the car, this represents 31,752,850 tons of coal loaded and handled in 1917 more than for the same period in 1916.

For reasons entirely beyond the control of the railroads, Mr. Elliott said, much of this very large increase in the movement of coal has sought markets other than those reached by Lake Erie ports and there had also been a reduction in the amount of coal loaded into boats at the ports because the season of navigation had been three weeks late this year, and in spite of the co-operative efforts of all there remained 17,110,000 tons of bituminous coal to be loaded and moved across the lakes in the 16 remaining weeks of lake navigation. Mr. Elliott said that as the fuel for domestic consumption in the northwest is largely supplied through Duluth and contiguous ports it was especially important to grant relief at once because it will be most difficult, if not impossible to obtain relief during the winter months by rail shipments because of the distance from the mines and weather conditions. He also pointed out that there are 18,000,000 tons of iron ore to be moved and that if coal is forwarded freely to Lake Erie ports empty cars are provided for iron ore going back, which will give a load in each direction and increase the total efficiency of the railroads, besides providing the necessary fuel and the iron ore needed for the furnaces up to June 1, 1918.

A somewhat similar shortage of coal shipments to New England has also been causing grave concern. A large part of the supply is customarily transported by water and the water shipments have been reduced because the government has commandeered so much of the boat capacity that would otherwise have been used for coal. A number of conferences have been held to discuss the situation but the northwestern situation has been dealt with first because it must be handled during the season of open lake navigation.

Increase in Coal Transported in July

Reports received by the Railroads' War Board show that the railroads carried 129,721 more carloads of bituminous coal from the mines in July this year than during July, 1916. This increase, which amounts to 20.4 per cent, makes available for consumption 6,486,000 tons of coal in excess of the amount that would have been available had the railroads merely duplicated their July, 1916, performance. Through co-operative effort, however, and by giving preference to the movement of coal, the roads that handle the bituminous product loaded 764,965 cars last month as against 635,244 cars in July, 1916.

The railroads also achieved an increase in their average daily loading of bituminous coal in July this year over the average amount loaded in June this year, loading an average of 30,599 cars a day in July as compared with 30,059 cars in June. There was an increase in the average daily loading in all districts east of the Mississippi and an actual increase in the number of cars loaded in July this year compared with the month previous in the low volatile fields of Pennsylvania, Maryland, West Virginia and Eastern Kentucky and the high volatile coal fields of West Virginia.

The most notable increase in the total shipments in July this year as compared with July, 1916, occurred in Illinois, Indiana and Western Kentucky. It amounted to 84 per cent.

The total increase in the amount of bituminous coal handled by the railroads for the months of April, May, June and July this year over the same months last year amounts to 578,536 cars or approximately 28,886,000 tons. This is 25.10 per cent more than the amount handled for these four months in 1916, and is indicative of the increased efficiency shown by the railroads since they voluntarily agreed to merge competitive activities and co-ordinate their operations in a single continental railway system in order to produce a maximum of national transportation efficiency during the period of the war.

Increased Efficiency in June

Twenty-nine railroads, operating about half of the country's railway mileage and owning about half of the freight cars performed 25 per cent more freight service with only 3 per cent more cars in June, 1917, than in June, 1916, according to reports thus far submitted and compiled by the Commission on Car Service. This was accomplished not only through the co-operative efforts to bring about an increase in the loading of cars, thereby securing a greater utilization of their capacity, but also by a large increase in the trainloading and in the mileage per car per day, with a reduction in the empty car mileage. The comparison of the reports for June, 1917, with those for June, 1916, is as follows:

	June, 1917	June, 1916	Per Cent Increase
Mileage operated	125,488	125,338	0
Freight cars owned	1,284,644	1,248,160	3
Revenue ton miles	19,676,463,348	15,650,194,737	25.7
Non-revenue ton miles	1,877,249,235	1,738,781,962	8.0
Total ton miles	21,553,712,583	17,388,976,699	24.0
Freight car miles	1,228,765,973	1,049,407,942	17.1
Tons per train	656	589	11.0
Tons per car	25.3	22.6	12.0
Average miles per car per day	31.8	28.0	13.6
Per cent empty car miles	30.8	30.2	0.6

Effect of New Law on Tariff Filing

Railroads apparently took advantage of the opportunity afforded them by the Interstate Commerce Commission's notice of August 10, that approval of a proposed advance rate must be secured from the commission before the tariff is forwarded for filing, but approving the filing of tariffs in transit or forwarded for filing prior to August 15, by rushing to Washington before midnight on August 14 as many tariffs as could be got together in the short time allowed, proposing advances in rates which were under consideration. Tariff clerks in the employ of the commission have estimated that the number of tariffs filed on August 14 and 15 suddenly jumped from an average of around 250 a day to nearly 3,000. Among those filed are a large number proposed by the eastern roads proposing advances in commodity rates which are based directly on class rates and which have usually fluctuated with them, for the purpose of bringing them up to the level of the increased class rates allowed by the commission in the fifteen per cent case. The commission has specifically ruled that such rates were not included in the meaning of its decision in that case but the roads had decided to make an effort to have them advanced correspondingly and therefore filed as many of the tariffs as possible to get them into the files before the taking effect of the new procedure caused by the amendment to the interstate commerce law requiring the approval of the commission before the filing of tariffs containing advanced rates until January 1, 1920. Among the articles on which advances are proposed in the new tariffs are livestock, dressed beef, iron and steel articles, and grain and grain products. Also many commodity rates are proposed to be advanced by the filing of supplements cancelling the commodity rates and referring to the class tariffs.

The filing of the new tariffs does not, of course, render

them immune from further proceedings in the way of protests or complaints leading to informal or formal proceedings, but avoids the formalities now made necessary before a tariff can even be filed. While no official notice has been made public it is understood that a tentative form of procedure has been adopted by which carriers wishing to file advanced rates will explain their purpose in advance to J. M. Jones, chief of the tariff division, and the members of the suspension board. In simple cases the filing will probably be allowed as a matter of course. In more important cases shippers would probably be notified and an informal hearing held similar to those now held where shippers ask the commission to suspend a tariff that has been filed but not yet become effective. In a case like the fifteen per cent case the commission might institute a formal ex parte proceeding as it did in the recent case.

To Reduce Accounting Requirements

The Railroads' War Board has under consideration a plan for requesting the Interstate Commerce Commission to reduce during the war its requirements of the railways in the way of reports and statistics. The Committee on Corporate, Fiscal and General Accounts of the Association of American Railway Accounting Officers has been asked to study the question and consider a possible reduction in the accounting system now required by the commission.

WILL KEEP RECORDS OF PUBLIC'S CO-OPERATION

Admitting that public co-operation and helpfulness, inspired by patriotism, are chiefly responsible for the remarkable record of increased transportation service shown under pressure of heavy war demands, the eastern railroads will compile a record that will show just "when, where and how much" this friendly treatment has helped their efforts.

This unique contribution to war-time business literature —a "Chronicle of Co-operation" or "History of Helpfulness"—will be written in an effort to extend and perpetuate the new spirit which, the transportation chiefs aver, bids fair to be a most potent force in aiding them to fulfill their pledge to the government to "produce a maximum of national transportation efficiency" for the winning of the war. The record will be made up from day-to-day reports of specific acts of shippers, passengers, employees, public officials and others which definitely contribute to greater service, with an accurate accounting of the benefits of such helpful acts in mileage, cars, tonnage, fuel or dollars saved.

In an official request sent to railroad executives last Friday by L. F. Loree, president of the Delaware & Hudson and chairman of the Eastern Department of the Railroads' War Board, he said: "Co-operation of patrons and public, in many quarters where there has been indifference or hostility, it must be admitted is largely responsible for the splendid results thus far attained. A spirit of helpfulness on the part of persons dealing with the railroads, prompted by patriotism in face of actual war, has permitted economy and efficiency in operation previously not attainable. Fully to meet, on the part of the railroads, this friendly spirit, and to develop and extend such co-operation as a potent means toward gaining maximum service to win the war, it is deemed desirable that a record be kept showing just how the public attitude has helped."

A War Lesson of Lasting Benefit

Chairman Loree in explaining the new move said: "Actual value of friendly co-operation by the public with the railroads—as measured by larger, better and more economical service—necessarily has been a matter of theory, subject to contradictory opinions, in the past. We now expect to be able to show by actual experience what a fair attitude toward the railroads by the public means in the way of benefits to the public. This should furnish one of the many valuable lessons of the war, and it is our duty to make the most of it.

"The railroads have gone the limit to help the government in winning the war, surrendering their property and subordinating every personal advantage and profit to the nation's needs. The people have responded by greeting our efforts with appreciation and approval, in many quarters affording aid and co-operation that is invaluable and necessary to the best results.

"If we are able to extend and perpetuate this constructive, helpful spirit toward the railroads it will bring good results that are almost incalculable, and which will be permanent in their effect on American business, prosperity and progress.

"Railroad operators constantly are engaged in intensive studies for efficiency, economy and general improvement which the public hears nothing about. The theory that better public relations would yield improved service has been generally accepted, and we have sought earnestly to bring them about. In view of the accomplishments of the past hundred days, some have asked why the railroads have not reached such a height of service before this. Recent experiences have furnished the answer in striking fashion.

"The action of the Committee on Coal Production of the Council of National Defense in pooling their shipments alone has permitted the railroads to haul to Atlantic ports 6,640,000 tons more bituminous coal than they did last year, with an estimated saving of 133,000 freight cars. The coal producers have eliminated the great accumulation and the long delays of cars at the ports by patriotic action.

"Latest reports from about 60 per cent of the mileage of the country show that these lines rendered 16.1 per cent more freight service during May than last year, with practically the same number of cars and locomotives.

War Requirements to Be Still Greater

"The demands upon the carriers will be greater and greater as the war proceeds, and much remains to be accomplished in the way of improvement. The Nation's needs in transportation certainly will call for the utmost of patriotic co-operation from every citizen concerned, both in and out of the railroad service.

"Two items of co-operation, which lie with our public authorities should be afforded the railroads forthwith: First, the local, state and national government officials should not press for improvements and new construction that will not directly operate to increase the capacity of the lines for national service and contribute toward winning the war. With every man, machine and dollar available necessary to the war work, non-essential improvements such as new station buildings and grade-crossing changes should be deferred. Second, the so-called 'full-crew laws' still existing in some 20 states should be repealed or suspended for the war period, inasmuch as these statutes are compelling the railroads to transport an aggregate of over 20,000 trainmen in idleness, these able bodied and experienced employees being greatly needed to man additional freight trains and troop trains.

"Splendid progress is being made, and with a better public understanding of the benefits to be derived, still greater results may be hoped for."

Mr. Loree's Letter

Mr. Loree's letter to the presidents of all the railroads in the eastern department follows:

"The great increase in transportation service—particularly freight-carrying capacity—shown by the railroads since the special organization was formed to meet war demands, has occasioned considerable surprise and wonder, with some misunderstanding, on the part of the public. The question

has been asked, 'Why was not this greater efficiency attained before?'

"Co-operation of patrons and public, in many quarters where there has been indifference or hostility, it must be admitted is largely responsible for the splendid results thus far attained. A spirit of helpfulness on the part of persons dealing with the railroads, prompted by patriotism in face of actual war, has permitted economy and efficiency in operation previously not attainable.

"Fully to meet, on the part of the railroads, this friendly spirit, and to develop and extend such co-operation, as a potent means of gaining maximum service to win the war, it is deemed desirable that a record be kept showing just how the public attitude has helped.

"The savings effected in time, men, equipment and capital—with consequent increase in capacity of public service—by shippers' bettered practices, by more considerate and reasonable action of public officials, by care, energy and intelligence of employees, might be recorded, with credit bestowed where due, and the facts given to the public as the war work proceeds. The record should consist of definite, confirmed facts, with specific instances in point, and the benefits given in units of mileage, tonnage, cars, fuel or dollars added to capacity.

"The American public at home, and our citizens risking their lives abroad, alike will be interested to know what persons and forces have exerted every effort for national safety and for victory.

"Specific reports of gains and benefits might be noted in the following general branches: (1) Promptness in loading of freight cars; amount of former delay in idleness of equipment eliminated, and value thereof in number of cars added to service, and in use of warehouse, track and landing space. (2) Extent of loading cars to full capacity, or to desired 10 per cent in excess of marked capacity, with percentage of reduction of former '57 per cent of unfilled space in cars. (3) Reduction of premature ordering of cars, or ordering in excess of needs, through careless checking of cargo or unreadiness for loading. (4) Minimizing of damage and delay in transit and at destination by improved methods of packing cargoes. (5) Elimination of avoidable reconsignments, 'blind' shipping orders and kindred practices causing delays and extra handling. (6) Public authorities' and officials' actions toward reasonable and intelligent imposition of regulations and restrictions, tending to prevent unnecessary obstruction, inconvenience, loss and delay to the free flow of traffic. (7) Acts of employees of all ranks toward eliminating waste and lost motion; and also their conduct in meeting properly and supplementing the co-operative efforts of patrons. (8) Any and all specific instances wherein the action of a patron of your railroad has been the means by which greater service and efficiency has been attained.

"We deem it our duty to omit no effort to encourage and reward the 'win-the-war' spirit and believe that a general interchange of experiences and ideas on the subject, with full information given to the public, will be of lasting constructive benefit."

COAL DISTRIBUTION COMMITTEES IN ENGLAND.—The mayors of all the principal towns in Great Britain recently received a letter from the Controller of Coal Mines, asking them to organize a local committee for the distribution of coal during the coming winter. The suggested constitution of such a committee was as follows:—The mayor or deputy, the chief constable, two coal merchants, one representative of each railway, one representative of each canal, and a secretary. The railway and canal representatives were to act in an advisory capacity only. A letter suggesting labor representation was sent to each mayor or deputy at a subsequent date.

THE RUSSIAN RAILWAYS SITUATION

The following is taken from correspondence of the Associated Press in the (New York) Mail:

John F. Stevens and his associates on the American Railway Commission now in Russia to assist the administration of Russian railways to increase their efficiency, have discovered many ways in which transportation may be speeded up on all lines without additional equipment.

The commission has advised the United States government to supply Russia with 2,500 more locomotives and 40,000 more freight cars as soon as possible. However, it will be long before this rolling stock can be manufactured and shipped to Russia. The shortage of bottoms on both Atlantic and Pacific will delay delivery of the new rolling stock, and additional shops must be erected at Vladivostok before such great quantities of locomotives and cars can be put together speedily.

The Russian roadbeds are in excellent condition. Virtually all lines were well built and the tracks have been kept up, chiefly through work of peasant women, in spite of the shortage of labor created by the heavy war draft upon the male population.

After traveling the full length of the Trans-Siberian line and inspecting many important lines in central and southern and European Russia, the American engineers found that Russian railway men are working at great disadvantage in not having up-to-date equipment for coaling, watering and cleaning locomotives.

At nearly all stations in both European and Asiatic Russia, engines are watered by 8-in. pipes. From 12 to 20 minutes is required for work which is accomplished in the United States in four or five minutes.

By the Russian methods 24 hours is required to clean a locomotive, coal it and get up steam again. The Russian engine houses lack the hot water equipment. Engines are allowed to cool before they are washed.

Oil is used as fuel for locomotives in southern Russia, but in Siberia and northern European Russia coal and wood are fuel. The facilities for loading wood are bad and plans are under way to improve the system. Water is supplied to passenger cars by buckets at most stations. Few stations have the hose necessary to water cars in a hurry. These have not been required because engines took water so slowly and labor was so abundant that it was possible to supply the cars with water by hand while the locomotive was being cared for.

But now even the labor of women must be economized as much as possible. Women are required in the fields. They are the baggage handlers at most stations, and are even firing locomotives. Wages necessarily have risen with the increased cost of living and every possible labor saving device must be used.

Because of the lack of skilled labor, the inadequacy of repair shops and the scarcity of metals and other supplies many locomotives on the Russian railways are out of repair. The American engineers have advised an immediate extension of repair shops and employment of foreign mechanics if necessary to restore these locomotives to service immediately.

Pig iron is among the needs of Russia which officials have reported to the American experts. Worn rails and other iron and steel have been used prodigally by the railways in construction work. At nearly every railway station in Russia tons of old steel rails are in use as hand railings. They are used at railway crossings for fences and are found in many other places on railway property where wood would serve as well. In the larger centers hundreds of tons of old steel and iron could be collected by the government from railway property on short notice. This material would meet the urgent demand for iron without placing further

burden upon overloaded ships, and it is not unlikely that the government will avail itself of this metal.

Railway administration in Russia is not centralized sufficiently to get the greatest possible service out of tracks. Trains are operated on local orders. By the employment of division superintendents and institution of a more general system of dispatching, the American engineers believe, greater service can be obtained from all lines.

Since the overthrow of the emperor, railway employees have chosen their own officials. The success of such a system is doubtful. But it was necessary, apparently, to throw off the domination of the old bureaucracy.

THE PRESIDENT FIXES THE PRICE OF COAL

President Wilson in accordance with authority granted by Congress has issued the following proclamation:

WHITE HOUSE,
Washington, Aug. 21, 1917.

The following scale of prices is prescribed for bituminous coal at the mine in the several coal-producing districts. It is provisional only. It is subject to reconsideration when the whole method of administering the fuel supplies of the country shall have been satisfactorily organized and put into operation. Subsequent measures will have as their object a fair and equitable control of the distribution of the supply and of the prices, not only at the mines but also in the hands of the middlemen and the retailers.

The prices provisionally fixed here are fixed by my authority under the provisions of the recent act of Congress regarding administration of the food supply of the country, which also conferred upon the Executive control of the fuel supply. They are based upon the actual cost of production and are deemed to be not only fair and just but liberal as well. Under them the industry should nowhere lack stimulation.

WOODROW WILSON.

Note.—Prices are on f. o. b. mine basis for tons of 2,000 pounds.

	Run of Mine	Prepared Sizes	Slack or Screenings
Pennsylvania	2.00	2.25	1.75
Maryland	2.00	2.25	1.75
West Virginia	2.00	2.25	1.75
West Virginia (N. River)	2.15	2.40	1.90
Virginia	2.00	2.25	1.75
Ohio (thick vein)	2.00	2.25	1.75
Ohio (thin vein)	2.35	2.60	2.10
Kentucky	1.95	2.20	1.70
Kentucky (Jellico)	2.40	2.65	2.15
Alabama (big seam)	1.90	2.15	1.65
Alabama (Pratt, Jaeger and Corona)	2.15	2.40	1.90
Alabama (Cahaba and Black Creek)	2.40	2.65	2.15
Tennessee (Eastern)	2.30	2.55	2.05
Tennessee (Jellico)	2.40	2.65	2.15
Indiana	1.95	2.20	1.70
Illinois	1.95	2.20	1.70
Illinois (third vein)	2.40	2.65	2.15
Arkansas	2.65	2.90	2.40
Iowa	2.70	2.95	2.45
Kansas	2.55	2.80	2.30
Missouri	2.70	2.95	2.45
Oklahoma	3.05	3.30	2.80
Texas	2.65	2.90	2.40
Colorado	2.45	2.70	2.20
Montana	2.70	2.95	2.45
New Mexico	2.40	2.65	2.15
Wyoming	2.50	2.75	2.25
Utah	2.60	2.85	2.35
Washington	3.25	3.50	3.00

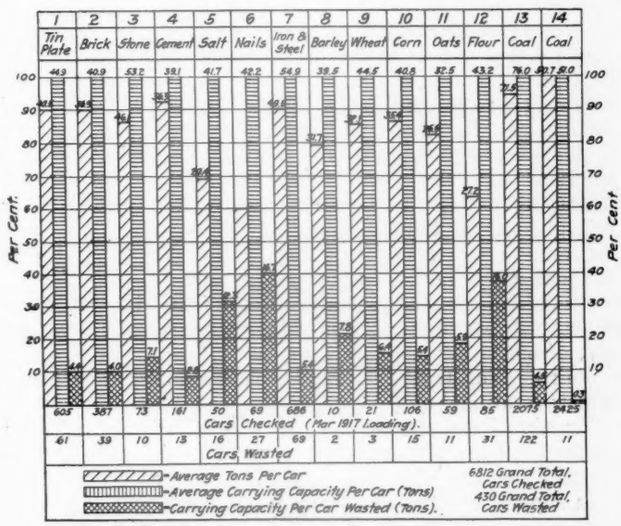
ITALY EXTENDS AERIAL MAIL SERVICE.—In addition to the recent establishment of aerial mail service between Turin and Rome, Consul General David F. Wilbur, of Genoa, Italy, reports the successful inauguration of an aerial postal service between the Italian mainland and the island of Sardinia on June 27, and between Naples and Palermo (Sicily) on June 28.

DETERMINATION OF CAR REQUIREMENTS OF A RAILROAD*

During the course of a recent conversation with Mr. A, I was asked the question, "How many freight cars should the North & South Railroad Company own in order to meet the demands of commerce upon it?"

My answer to the question was in substance that freight cars owned by the North & South Railroad Company, considered without reference to classification were probably sufficient to meet satisfactorily a large percentage of what might be termed normal or average requirements, providing the cars be maintained properly, handled efficiently, and the carrying (or cubical) capacity utilized fully, but that the classified freight car requirements could be determined only by analyzing carefully those details of operations applicable to a series of months which reflect clearly the relationship of the supply of each class of freight cars to the demands for each class of freight cars, and that I would undertake to develop such facts as could be accepted as a reliable basis for a formal answer to his question.

Many theories and opinions have been advanced with reference to the true measure of a railroad's obligations from the standpoint of freight cars required to enable it to render reasonable service as a common carrier, these theories and



Statement Used by the Pennsylvania Lines West of Pittsburgh Showing the Percentage of Journal or Cubical Capacity of Freight Carrying Cars Utilized by Shippers of Various Commodities at "Car Load" Rates During March, 1917

opinions having crystallized into two quite distinct and logical conclusions, namely:

1. That on account of the diversity of traffic conditions, and the fact that to a large extent each individual carrier line serves territory which produces traffic not common to territories served by all other lines, forming parts of through routes over which traffic moves, the obligations of an originating carrier should be to provide a sufficient number of cars to accommodate traffic of shippers served by it regardless of what might be the destination of the traffic, this conclusion being especially significant in its relation to the products of certain industries in the Pittsburgh district, which are distributed throughout the United States, including Mexico and Canada, although cars conforming to a special design are required for the transportation of them; and

*Excerpt from letter written by a transportation officer of one of the larger railroads relative to the classified freight car requirements of that system.

2. That traffic which comes to a railroad irrespective of the character, or source of the traffic, constitutes the measure of that company's obligations in the nature of car supply as a common carrier, the measure of responsibility as between (or among) carriers which participate in earnings from the transportation of traffic via a joint through route being dependent upon different factors, the more prominent of which are:

(a) The *permanency* of traffic, i. e., the known ability of a carrier to prevent diversions of traffic to other roads;

(b) Ratio of mileage (road-haul) of each carrier forming part of a joint through route to the total mileage (length of the joint through route);

(c) Ratio of gross earnings of each carrier forming part of a joint through route to the total gross earnings of all interested carriers derived from the transportation of traffic;

(d) The general nature of service other than road service incident to the handling of traffic on each of the lines forming part of a joint through route;

(e) The average detention per car to cars engaged in through service; and

(f) The ratio of the empty mileage on each line forming part of a joint through route of cars engaged in the through service, to the total mileage made by such cars on the joint through route.

The correctness of the first conclusions could not be questioned if disposition of the majority of all classes of freight which represent the larger volume of traffic handled by carriers, conformed to spasmodic and irregular orders requiring distribution of the traffic among a great variety of destinations, but this is not true, the fact being that producers of practically all classes of traffic find permanent markets for it and establish permanent arrangements governing its movement, the exceptions to this customary or general order of things being:

First. The outgrowth of such extraordinary conditions as those which prevail at the present time;

Second. The natural consequences of inferior service on the part of certain carriers in comparison with service on the part of other carriers;

Third. The results of radical commercial developments in new localities; and

Fourth. Demands for cars of a peculiarly special type required for the transportation of traffic which will ordinarily seek markets where the most favorable prices obtain.

In support of the first conclusion, it seems proper to state that if the business conditions were to remain permanently on substantially the same basis as the basis which we consider extraordinary, and attributable to the war involving both the old and the new world, a common carrier could not afford to authorize large expenditures for the acquisition of new cars for the reason that its representatives would be without any means whatever of controlling the movement of traffic via a certain route, laws and decisions of the Interstate Commerce Commission prohibiting carriers from dictating as to the routing of traffic, but compelling them to permit of the movement of freight cars to any destination in North America covered by a joint route and through rate.

If history of the past may be accepted as a reliable guide for speculation pertaining to the future, it is reasonable to believe that carriers should not base their developments with reference to increasing the number of freight cars upon the extraordinary situation now prevailing, but upon the more substantial and normal business conditions which preceded and which will follow the present conditions; hence I feel that the second conclusion rests upon the correct principle, and my efforts to determine the classified car requirements of the North & South have been exerted in that direction.

From my standpoint, neither the kind of traffic which offers for movement via the lines of a common carrier, nor information with reference to its origin or destination, has a direct bearing on the obligation of that carrier to furnish cars beyond the limits to which the volume of traffic varies from time to time, and that result is determinable by the consideration of three details, namely:

I. The average number of classified cars on the lines of of a common carrier, daily;

II. The number of classified cars owned daily during a period to which the first detail applies; and

III. The ratio of classified cars furnished applying on orders to the total number of classified cars ordered during a period to which the first two details apply.

In other words, were all carriers to decide arbitrarily that not a single system car would be permitted to go beyond the limits of their lines, and that not a single foreign car would be accepted in interchange, the obligation of each carrier from a car supply point of view, would be represented by the number of cars required to take care of strictly internal business; through traffic from junction points with connecting lines to junction points with other connecting lines; traffic from junction points with connecting lines to local stations; and traffic from local stations to junction points with connecting lines.

We have, of course, grown beyond such a scheme, but the principle underlying it is perfectly sound in its application to the present arrangement, which contemplates the free interchange of cars among various parts of what the Interstate Commerce Commission has elected to term the "National Railway System." Under this (present) arrangement, there are a certain number of each of different classes of freight cars in the possession of the North & South each day, or an average number daily within each calendar month; and calendar year. Numerous conditions affect this detail, and it is therefore a variable one, the changes being influenced largely by variations in business conditions. These facts preclude the use of the detail, applicable to the operations of one period, as a measure for freight car requirements, but they lead logically to the conclusion that if the detail applicable to operations of each of a number of months when the car supply is slightly under the actual demands, considered in conjunction with the additional details, number of each class of cars owned, and the ratio of each class of cars furnished applying on orders to the number of each class of cars ordered, the results thus obtainable can not be other than the number of cars of each class required to handle the traffic. Example: the average number of box cars on a line daily, based on operations of several months, is represented by 6,000 cars. The number of box cars owned during the same period of several months is represented by 4,000 cars. The average number of cars required daily for loading at local stations during the period is represented by 2,000, of which 95 per cent are furnished. On this basis of the operations, 6,000 cars were used daily to meet the various demands; the average number of cars available daily for application to local orders was 100 cars short of the requirements and the average number of cars on the lines daily exceeded the ownership 2,000 cars, hence the cars owned were equal to about two-thirds of the cars required.

Unfortunately, records available did not embrace details which were essential to a satisfactory study of the operations of the North & South Railroad Company, in connection with the handling of cars during several years, but from information which I have obtained from special reports and statistics, the diagram was prepared and has been used as the basis for conclusions as to the classified freight car requirements of the North & South.

AGED MEN RUN BRITISH ENGINES.—Overcome by the heat, a London & North-Western engineer, aged 71, fell off the footplate of his engine at Birmingham and was killed. Owing to the war, the company, it developed, has many men over 70 years of age working local trains.

THERMOSTATIC METAL

The General Electric Company, Schenectady, N. Y., has perfected a new product designated as G-E Thermostatic Metal which takes a curve or regains its original straightness in accordance with well defined laws as the temperature rises or falls. As a result of this responsiveness to temperature change and the mechanical force developed, this metal is used to actuate various mechanisms which tend to neutralize either the temperature change or its effect upon devices.

The metal is made up of two strong non-corrosive metals possessing a wide difference in co-efficients of expansion, the widest difference possible for any known stable combination of metals. These two metals are firmly attached to each other throughout their entire length so that there is absolutely no slip of the one upon the other. Thermostatic metal can be cut, stamped or pressed into practically any desired shape, and when annealed will have all its original inherent qualities; moreover, it will not deteriorate nor take permanent set under applications of heat or force within definite practical limits. The metal is manufactured in various standard thicknesses ranging from 0.25 to 0.015 in.; the maximum width is 4 inches and the maximum length is 36 inches.

This metal can be used for temperatures as high as 500 deg. F. The deflection per degree temperature change besides being quite considerable as shown by Fig. 1 is a constant for any definite piece of the metal, and since a definite and considerable opposing force is necessary to cause the metal to take permanent set (see Fig. 2), the metal can be depended upon when used in devices where extreme accuracy is required.

If the curving of this thermostatic metal on heating or cooling is opposed, the metal will produce a mechanical force (see Fig. 3), which is limited only by the force required to produce permanent set. For example, Fig. 3 shows that a piece of thermostatic metal 0.1 in. thick, 5/16 in. wide and 4 in. long will exert a force of 24 ounces (1½ lbs.) on being restrained from bending when subjected to a temperature change of 100 deg. F. This curve illustrates the laws that the force exerted by this metal varies as the square of the thickness, directly as the width and as the square of the temperature.

The length or thickness of the metal alone affect the deflections of the metal, the width of the piece having no influence. From these curves it will be found that the deflection for any given temperature change varies directly as the square of the length of the piece of thermostatic metal and inversely as the thickness of the piece. As previously pointed out, the deflection of any piece of metal varies directly as the temperature change.

This metal is used in the products of many different industries owing to the fact that it can be successfully worked into different shapes and forms. In some of its applications it is used to actuate mechanisms directly by means of the force developed within itself when its tendency toward assuming a curved shape is restrained. In other applications it is used to close and open the contacts of electrical circuits by means of which various devices are operated.

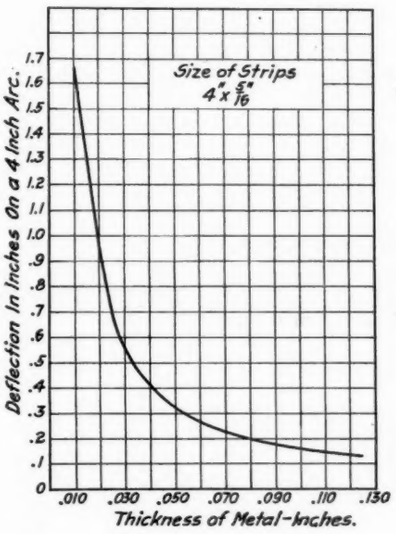


Fig. 1—Deflections Caused by a Temperature Change of 100 Deg. F.

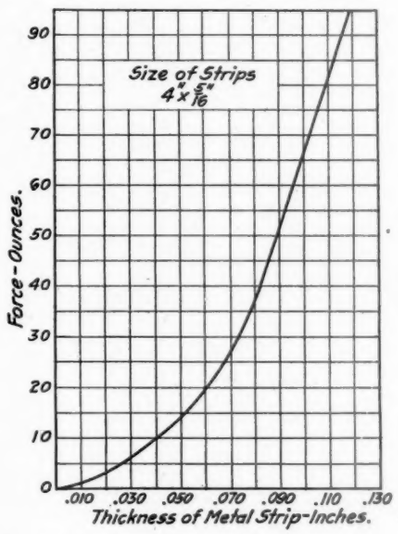


Fig. 2—Force Required to Give Permanent Set

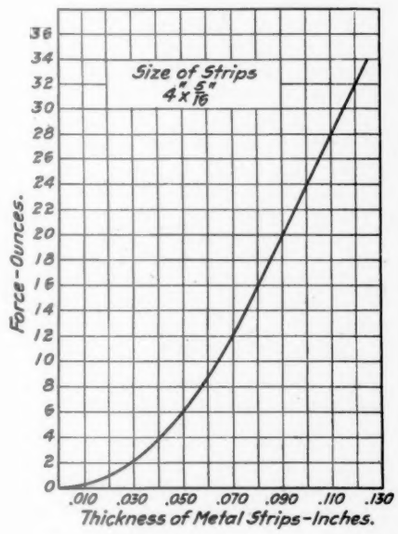


Fig. 3—Force Exerted by Metal Strip at 100 Deg. F.

STANDARD GAGE IN EUROPE.—The disadvantages of the variety of gages within this Empire has been keenly felt during the war. Had there been a universal gage rolling stock might have poured in from all parts to points where it was most wanted. But something more than a universal track-gage is wanted if the full benefits are to be obtained from it. When it was proposed to exhibit some of the French locomotives in England it was found that they could not be run over English lines to their destination owing to their rolling stock dimensions fouling our minimum fixed structures. This fact will tell heavily against the usefulness of the channel tunnel, as it will prevent that free interchange of rolling stock without which traffic will be greatly hampered. The world is shrinking so rapidly that the different gages in Africa, in India, in Russia, and even in Ireland are rapidly becoming an intolerable nuisance, and, in time, it will be found absolutely essential to bring them all to one standard, including the running and fixed dimensions; if the smallest of these, on the 4 ft. 8½ in. gage, be selected as the standard, the conversion could be effected gradually at comparatively little cost. A difference in gage has been considered a safeguard against invasion, both in Russia and in India. As regards Russia's European and Eastern Asian boundaries the break of gage has not stopped invasion and has hampered the defenders as much as it has the offenders.

General News Department

The National Association of Railway Agents concluded its semi-annual meeting at Cedar Point, Ohio, on August 16.

The old stone arch bridge, which was described in the *Railway Age Gazette* of August 17, 1917, page 278, is located at Gwynn's Falls, on the Mt. Clare branch of the Baltimore & Ohio, near Baltimore.

Senator Owens has introduced a bill to authorize the Interstate Commerce Commission to determine when a car shortage exists on a railroad, and to order the road to provide sufficient and suitable cars.

According to the Southern Pacific Bulletin the Southern Pacific reports that the average carload on the Portland division has been increased to 26.5 tons in June, 1917, as compared with 22.3 tons for the same month in 1916, or an improvement of nearly 19 per cent.

The Atchison, Topeka & Santa Fe has announced an increase in wages, ranging from 11 to 15 per cent, to car and locomotive employees. This increase is in addition to the ten per cent bonus which will be paid at the end of December. The new scale will go into effect September 1.

Because of the increased value of scrap paper, the Southern Pacific has adopted a policy of retaining magazines, old records, newspapers, etc., for shipment to the stationery storekeeper at West Oakland, Cal. During the month of June the West Oakland collecting office disposed of nearly 16,000 lb. of waste paper that had been forwarded from all parts of the Pacific system.

Announcement is made in another column of the appointment of Elisha Lee, general manager of the Pennsylvania Railroad, as acting vice-president in charge of operation during a leave of absence granted to W. W. Atterbury. No official announcement has been made of the reasons for the leave of absence granted Mr. Atterbury, but it is understood that he will go to Europe, and be in charge of certain phases of the transportation system of the Allies.

The Southern Pacific has announced that nearly $4,000 in bonuses will be paid to the 86 employees of the system who have left the service of the company to enter the army or navy. By leaving the employ of the road employees forfeit all claim to the second half of the ten per cent bonus which was payable on June 30 to employees in active service, but notice has been given that such breaks in the service as were occasioned by enlistment will be waived and the bonuses paid.

Heavier loading enabled the Baltimore & Ohio to save the use of 6,238 cars in the handling of less than carload freight in July, compared with the same month last year. At the same time the company handled 12,000 more tons of this class of freight in 4,000 less cars, according to the report of the transportation department which has just been compiled. Last month the Baltimore & Ohio handled 1,393,660 cars in freight trains, 928,684 of which were loaded. While the loaded car movement is indicative of the general business activity, hot weather interfered somewhat. It is expected that the company will handle more than 1,000,000 loaded cars monthly during the fall.

The Rock Island Lines have issued a colored map of the United States showing the locations of national guard mobilization training camps, national army cantonment camps, reserve officers' training camps and government aviation sites. The regular army departments are shown by solid dividing lines, and are also named. The 16 new national army divisions are shown in separate colors, each camp being indicated by a circle, name and number. The national guard camps are indicated by blue stars, with the name of each, together with the names of the state which will be represented at each camp. Reserve officers' training camps and aviation sites, as well as forts, are shown in a distinctive way.

R. J. Clancy, assistant to the general manager of the Southern Pacific, has pointed out that railroad transportation is probably the only product, relatively speaking, that has decreased in price. "As indicated by the purchasing value of commodities," says Mr. Clancy, "railroad transportation is now approximately 50 per cent cheaper than three years ago. A bushel or sack of wheat, corn or barley, a bale of cotton or wool, or a ton of copper, iron or steel will buy approximately double the amount of railroad transportation it would three years ago. This is regardless of the fact that during the last three years wages of railroad employees and the cost of capital have greatly increased along with an increase of 100 per cent in the cost of fuel oil for locomotives and an increase of from 50 to 500 per cent in the cost of railway supplies, equipment and material."

The Committee on the Safe Transportation of Explosives and Other Dangerous Articles, of the American Railway Association, recently issued a bulletin to members containing additional rules and recommendations prepared by the Bureau of Explosives, covering the handling of dangerous traffic, with special reference to conditions incident to war requirements. The rules provide that properly qualified railway representatives shall be put in charge at all points where explosives or dangerous articles are handled or held for any purpose, whose duty it shall be to see that all employees comply with safety regulations. The regulations also provide that authorized persons only shall be permitted on railroad property used for the storage, handling, loading or unloading of dangerous articles, and specify in detail who shall constitute "authorized" persons. Necessary safety precautions which must be enforced at points where dangerous freight is handled are enumerated.

Mileage Allowance on Refrigerator Cars Increased

The American Railway Association has issued a circular announcing an increase, effective on October 1, in the mileage allowance paid for the use of refrigerator cars from ¾ of a cent to one cent per mile in eastern and southern territory, where the ¾-cent rate now applies. The rate in western territory has been one cent.

American Railroad Men Needed in Russia

J. F. Stevens, chairman of the railroad commission making an investigation of the railway situation in Russia, has telegraphed to Washington requesting that an American railway unit of 129 men, consisting of division superintendents, despatchers, trainmasters, engineers, master mechanics and one telephone expert, be despatched to Russia to educate the Russian railway men in American operating methods. The request has been referred to S. M. Felton, director general of railways, in charge of the organization of railway forces for service abroad.

Railroads Help Potato Conservation

A pledge made by the representatives of the railroads of practical co-operation in handling this year's big potato crop will greatly help plans for potato conservation, according to a statement issued by the Food Administration.

Equitable distribution of the crop is a great problem concerning the grower, the government and the public at large. The harvest of late potatoes runs for about six weeks, and the railroads have stated that it will be possible for them to handle approximately one-third of the crop during this time if shippers will see to it that cars are loaded to a maximum capacity of from 46,000 to 50,000, instead of 40,000 pounds, and also see to it that they are unloaded within 24 to 36 hours of their arrival at destination. Under the recent ruling of the Federal Reserve Board another one-third of the crop may be stored, later to be distributed as market demands afford opportunity, the remaining third to be stored by owners.

The recent ruling of the Federal Reserve Board in favor of

the issue of warehouse receipts, negotiable at member banks, on potatoes when properly graded, sacked and stored, is said to assure ample money with which to handle the big reserve stock, and to a large extent eliminate the waste of former years, caused by poor market facilities or glutted market terminals.

War Convention of American Business Men

A war convention of American business men has been called by the Chamber of Commerce of the United States, to be held at Atlantic City, N. J., September 18 to 21, inclusive. The general subjects discussed will be: The duty that business owes the government in war; How may the business of the country render greater service in winning the war? Ways and means by which business may most readily adjust itself to the conditions produced by the war, and For what readjustments after the war must business prepare? Under the general subject of How business may render greater service in the war, will be discussed the question, How shall greater efficiency of land and water transportation be developed?

New York Port Commissions Organize

The two commissions appointed by Governor Edge, of New Jersey, and Governor Whitman, of New York, to investigate the port conditions at New York, organized Wednesday in New York by electing J. Spencer Smith and William R. Willcox, respectively, chairman of the two commissions. General George W. Goethals was appointed chief consulting engineer, and will confer frequently with the commissioners.

The work, Mr. Willcox explained after the meeting, will pertain to all matters which affect the development of the port, the Jersey Meadows and all territory contiguous to the port, and when completed, it is expected, will result in more harmonious relations between the two states. The railroads will be consulted in the working out of terminal plans, etc., as will storage, warehouse and steamship companies. The commissions, after they have concluded their investigations, will make reports to the New Jersey and New York legislatures.

On the New York commission are William R. Willcox, E. H. Outerbridge and Arthur Curtis James, while on the Jersey commission are J. Spencer Smith, De Witt Van Buskirk and Frank R. Ford. Offices will be established at 115 Broadway, New York.

Frankness as an Element in Efficiency

Under the title, "Some Facts to Remember," E. E. Loomis, president of the Lehigh Valley, has posted, for the benefit of the employees of that road, a placard on the hackneyed subject of efficiency, but the placard is not hackneyed; it is notable for its freshness, and also for its excellent typography. Extracts follow:

Real Service: When we sell a ticket we sell more than a ride. When we issue a bill of lading our obligation extends beyond the mere movement of freight. In each case our patrons are entitled to and must receive prompt, courteous and accurate information and attention.

Passenger Service: If a train is late, say so. If you don't know how late it is, find out. If you expect or can get a later report, state when it will be available. Give special attention to the comfort of women and children. Help passengers to work out their train connections. Do not tell passengers Pullman space is unavailable until you are sure other stations cannot release space to you.

Do not argue. Passengers have a right to criticise railroad service. Criticism is frequently the basis of improvement. Improvement is the everlasting mark at which we must aim.

Trainmen: You are the official hosts of the company. You can make every passenger's trip a pleasant one. Make the passengers feel they are at home on one trip, and they will be with you on their next. This is more than good business policy; it is a manly—a courteous policy. It is the only policy.

Freight Service: Accepting freight is but the beginning of our service to a shipper. When he asks for information about that freight he is exercising a right—not seeking a favor. When a car is delayed, say so, and try to expedite its movement. If a car is lost, start the machinery that will locate it. Don't promise a shipper to place a car today if you know it cannot be placed until tomorrow.

If a shipper needs reports to satisfy a consignee, see that he gets them promptly and accurately. Help the shipper to hold his customers, and you will help us to hold the shipper as a customer. Give the shipper a maximum of service, attention and courtesy if you wish him to give you a maximum of tonnage.

GIVE REAL SERVICE.

The Extra Crew Law in New Jersey

The State Board of Public Utility Commissioners of New Jersey will begin hearings on September 17 relative to the application of railroads operating in the state to reduce the crews of specified trains. The trains affected are mostly freight trains, but there are some passenger trains on the list.

The roads contend there are now more men carried in the train crews of these trains than are needed. Applications are made under the repealer of the Full Train Crew law which was passed last winter, and became effective July 4. The law puts the matter in the hands of the Public Utility Commission. Railroads making the applications are: Central of New Jersey, Lehigh Valley, Delaware, Lackawanna & Western, Pennsylvania, West Jersey & Seashore, Philadelphia & Reading, Atlantic City, Lehigh & New England, Lehigh & Hudson River, and the Baltimore & Ohio.

It is understood that the trainmen have refused to accede to the withdrawal of any men of any train crew as now constituted. The trainmen intend to make each company prove that each reduction proposed is one where a full crew is not needed.

Army Section for Embarkation Service

A new section of the army general staff has been created to handle all business pertaining to the shipment of troops and supplies to Europe. Brigadier General Francis J. Kernan, assistant chief of staff, has been detailed temporarily as chief of the embarkation service, with Col. Chauncey B. Baker of the Quartermaster's Corps as his chief assistant. The functions of the section are explained in the following general order issued by the War Department:

"To enable the Chief of Staff to exercise effectively his supervisory and co-ordinating powers in respect to overseas movements there is hereby created in the office of the Chief of Staff, for the period of the existing war, a section to take charge of the embarkation of troops and supplies for transatlantic transportation, and to exercise under the Secretary of War the direct control incident to this service.

"The officer in charge is designated as the Chief of the Embarkation Service, and he will be given such assistance, commissioned and civilian, as may be necessary, with office rooms in the War Department building.

"The function of this section is to co-ordinate all shipments of munitions and supplies of every kind, and all troop movements whose ultimate destination is Europe, and to advise and assist the Chief of Staff in reference thereto. It will have direct supervision, under the Chief of Staff, of all movements of supplies from points of origin to ports of embarkation; will supervise the operations of the latter; and will control the employment of all army transports engaged in the transatlantic service and such commercial shipping as may be used to supplement that service. It will arrange with the navy for convoy service.

"It is made the duty of all chiefs of supply bureaus to keep the Chief of the Embarkation Service informed fully of the condition of supplies in their several bureaus, and to this end they will correspond directly with that officer. Direct correspondence between the Chief of the Embarkation Service and the commanding officers of ports of embarkation is authorized. Copies of all requisitions, requests, and information of every character received from the commanding general of our forces in Europe, or his subordinates, which bear upon reinforcements or renewals of supplies will be transmitted to the Chief of the Embarkation Service; and, in general, under the supervision of the Chief of Staff, this officer is charged with the duty of arranging that all supplies for our forces in Europe shall be forwarded in the most expeditious and convenient manner, and to that end he is authorized to call upon all supply officers for information and to exercise control in matters of shipment, both within the territory of the United States and in the overseas haul."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE, 1917

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Ann Arbor	294	$234,120	$45,057	$298,469	$31,163	$43,152	$5,107	$133,331	$650	$10,658	$224,061	$74,408	$13,100	$61,307	$21,081
Atlantic City	170	110,333	190,104	312,059	29,552	33,305	2,993	158,930	99	919	225,665	86,394	15,000	71,394	—18,273
Canadian Pacific Lines in Maine	234	80,870	20,947	113,588	57,259	19,395	6,109	59,726	.....	4,912	147,402	—33,815	5,500	—39,315	—46,405
Central of New Jersey	684	2,437,857	585,142	3,294,485	276,727	543,870	27,160	1,218,636	19,804	63,873	2,150,065	1,144,421	147,042	996,752	7,495
Chicago & Erie	270	656,478	59,360	775,790	66,763	95,889	19,965	325,687	2,028	16,874	526,581	249,208	31,275	217,933	—39,721
Chicago, Burlington & Quincy	9,373	7,650,174	2,068,230	10,660,943	1,426,428	1,261,580	172,093	3,448,952	116,694	227,326	6,653,072	4,007,871	432,035	3,575,836	1,130,471
Chicago Great Western	1,496	969,408	326,826	1,427,841	126,798	189,571	47,563	493,638	11,704	37,767	906,708	521,133	59,000	462,145	—505
Chicago, Terre Haute & Southeastern	375	289,347	17,358	314,851	37,585	36,902	3,605	108,251	4,302	8,145	198,791	116,060	17,786	98,274	18,910
Duluth, South Shore & Atlantic	600	279,382	95,753	404,250	93,628	43,144	6,238	153,729	4,499	7,452	308,690	95,560	199	95,361	12,499
Erie	1,988	4,989,920	859,767	6,561,351	579,781	1,432,918	106,059	2,656,305	40,024	131,291	4,944,823	1,616,528	224,485	1,391,841	—77,111
Georgia	307	187,553	74,829	283,639	22,520	57,134	13,963	117,610	176	8,923	220,222	63,417	5,890	57,423	26,907
Kansas City Terminal Co	24	.....	.....	91,136	7,007	13,272	.....	35,825	266	1,366	57,619	33,516	18,580	14,936	—15,755
Louisville & Nashville	5,070	4,636,839	1,258,545	6,283,465	811,463	1,280,928	133,629	2,187,423	22,275	136,330	4,564,344	1,719,121	510,544	1,204,328	—27,370
Mineral Range	120	86,839	2,858	92,348	25,835	18,013	600	53,465	.....	1,005	98,918	—6,570	4,277	—10,848	—30,100
Missouri, Oklahoma & Gulf of Texas	134	15,627	273	15,697	2,718	1,843	1,372	7,275	.....	1,425	14,632	1,047	184	863	4,394
Missouri Pacific	7,295	4,835,643	1,105,566	6,401,699	964,233	945,374	151,934	2,057,879	20,576	142,165	4,267,662	2,134,037	265,000	1,868,313	.....
Nevada Northern	165	194,568	17,807	217,282	27,199	23,412	567	37,080	65	5,231	93,554	123,728	20,156	103,572	5,563
New York Central	6,083	13,304,442	5,194,754	21,562,234	2,513,766	3,266,129	295,453	7,797,445	301,581	450,590	14,624,964	6,937,270	980,788	5,953,983	—263,945
Oahu Railway & Land Co	114	97,891	26,540	135,241	10,550	8,497	1,198	35,393	.....	10,879	66,478	68,763	—7,161	75,924	7,713
Oregon Short Line	2,307	1,993,257	515,568	2,747,341	343,619	261,353	37,072	672,331	46,969	78,977	1,440,322	1,307,020	191,372	1,115,181	130,713
Oregon-Washington R. R. & Nav. Co	2,052	1,419,891	471,414	2,099,654	298,820	178,371	47,066	664,326	31,306	82,094	1,301,539	798,115	96,618	701,359	353,636
Philadelphia & Reading	1,127	4,883,657	665,552	5,921,789	410,315	1,012,445	54,912	2,275,466	15,036	95,336	3,861,626	2,060,164	127,703	1,932,460	161,748
Pittsburgh & West Virginia	63	118,215	10,070	138,396	19,602	17,612	2,399	46,834	4,358	6,039	96,844	41,552	8,217	33,335	.....
Pittsburgh, Shawmut & Northern	205	85,290	4,828	92,997	18,433	47,597	1,145	45,702	.....	6,023	118,900	—25,903	1,774	—27,677	—46,612
Port Reading	21	147,166	.....	169,256	12,819	9,324	41	97,689	.....	429	120,231	49,024	12,000	37,024	—47,462
St. Louis, Iron Mountain & Southern*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis-San Francisco	4,752	3,025,292	1,162,912	4,609,647	453,228	633,886	69,111	1,497,625	.....	146,924	2,782,261	1,827,386	191,110	1,634,569	.....
St. Louis Southwestern	1,754	997,013	242,310	1,317,574	157,336	243,318	248,157	391,899	4,734	46,349	889,539	428,034	56,771	371,197	205,165
Staten Island Rapid Transit Co	24	51,994	65,538	133,747	15,157	13,511	1,552	61,849	.....	5,793	97,862	35,886	9,000	26,886	—17,590
Texarkana & Fort Smith	87	71,395	11,808	90,778	6,333	4,687	2,972	26,397	.....	4,120	44,418	46,360	7,396	38,921	26,360
Ulster & Delaware	129	51,464	32,102	104,218	9,475	10,551	4,472	48,866	400	6,514	80,278	23,940	4,000	19,952	9,543
Union Pacific	3,622	4,482,806	1,220,662	6,500,564	791,546	670,380	120,920	1,572,565	140,993	185,081	3,407,865	3,092,699	456,948	2,635,541	192,487

SIX MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Ann Arbor	294	$1,198,129	$240,433	$1,528,218	$145,397	$257,785	$32,657	$708,503	$2,598	$54,471	$1,201,411	$326,806	$78,600	$248,086	—$69,352
Atlantic City	170	529,984	604,072	1,202,221	155,053	132,271	19,472	703,216	576	4,451	1,014,525	187,695	65,000	122,603	7,099
Canadian Pacific Lines in Maine	234	1,308,877	125,644	1,511,094	178,884	203,105	35,253	657,464	.....	31,183	1,105,888	405,205	33,000	372,205	—109,411
Central of New Jersey	684	13,169,075	2,971,698	17,559,421	1,462,032	3,299,468	167,793	6,797,346	102,395	388,252	12,215,303	5,344,118	906,116	4,434,262	—570,024
Chicago & Erie	270	3,582,615	276,237	4,208,112	344,915	537,869	112,114	1,914,662	17,246	103,028	3,022,769	1,185,342	187,650	997,692	—390,680
Chicago, Burlington & Quincy	9,373	42,628,645	10,758,988	58,869,204	6,731,622	8,544,918	852,678	19,737,838	807,891	1,317,315	37,992,262	20,876,942	2,582,392	18,294,550	2,017,195
Chicago Great Western	1,496	5,441,466	1,686,543	7,834,877	956,800	1,368,446	274,316	3,099,415	69,698	265,238	6,025,950	1,808,926	313,000	1,492,348	—421,348
Chicago, Terre Haute & Southeastern	375	1,589,763	99,233	1,730,984	194,190	371,344	25,319	626,058	13,823	48,280	1,279,014	451,970	80,286	371,584	143,378
Duluth, South Shore & Atlantic	600	1,482,627	453,627	2,059,846	400,492	264,694	42,577	884,437	24,732	50,965	1,667,897	391,949	90,199	301,736	—34,155
Erie	1,988	25,245,923	4,538,126	33,397,404	2,878,955	8,350,413	570,316	15,411,441	219,246	765,640	28,185,493	5,211,912	1,346,910	3,851,247	—3,412,028
Georgia	307	1,171,955	433,584	1,741,975	158,933	284,213	81,751	722,108	926	56,939	1,304,383	437,592	34,415	403,055	51,516
Kansas City Terminal Co	24	.....	.....	557,812	45,503	75,851	.....	220,897	4,268	12,181	357,293	200,519	109,260	91,092	—31,358
Louisville & Nashville	5,070	26,405,167	7,074,239	35,896,340	4,417,672	6,823,488	795,721	11,877,120	176,415	743,789	24,762,200	11,134,140	1,874,624	9,251,173	—227,200
Mineral Range	120	556,384	16,973	586,835	132,301	117,978	2,755	334,086	.....	6,473	593,593	—6,758	19,277	—26,035	—77,545
Missouri, Oklahoma & Gulf of Texas	134	128,322	1,876	131,759	18,792	13,829	10,288	60,231	.....	10,065	113,205	18,554	1,102	17,444	28,551
Missouri Pacific ‡	165	1,068,908	83,130	1,179,748	119,438	117,893	4,421	217,668	512	29,280	489,212	690,536	61,156	629,380	66,169
Nevada Northern	6,083	70,849,022	25,947,480	112,480,113	11,725,999	20,354,845	1,545,172	45,816,280	1,654,334	2,651,958	83,748,589	28,731,523	5,651,623	23,062,999	—9,809,828
New York Central	114	460,397	140,751	663,323	69,304	53,222	5,494	181,232	.....	35,308	344,488	318,835	52,713	266,122	—3,071
Oahu Ry. & Land Co	2,307	10,824,206	2,541,551	14,477,376	1,633,060	1,601,481	221,138	3,856,471	239,658	466,944	8,014,301	6,463,074	985,422	5,475,463	675,763
Oregon Short Line	2,052	7,209,361	2,326,084	10,424,241	1,524,694	1,075,678	276,578	3,377,467	144,516	466,023	6,856,099	3,568,142	596,618	2,970,872	1,491,768
Oregon-Washington R. R. & Nav. Co	1,127	26,674,551	3,569,631	32,354,642	1,926,991	5,629,650	293,994	13,426,590	83,168	542,454	21,889,071	10,465,572	818,561	9,646,187	—1,890,827
Philadelphia & Reading	63	318,476	29,430	377,135	52,020	53,380	5,659	130,586	10,872	18,804	271,322	105,813	26,857	78,956	.....
Pittsburgh & West Virginia	205	575,107	32,064	623,205	90,325	302,334	7,254	287,140	.....	30,136	717,190	—93,986	10,719	—104,704	—311,345
Pittsburgh, Shawmut & Northern	21	808,847	.....	927,182	50,414	58,943	236	551,601	.....	4,033	664,822	262,360	62,000	200,360	—48,932
Port Reading	4,752	18,114,624	6,500,155	26,607,265	3,143,876	4,432,252	399,184	9,039,560	.....	770,861	17,660,301	8,946,964	1,128,094	7,809,848	.....
St. Louis-San Francisco	1,754	6,202,088	1,306,575	7,972,549	888,533	1,555,966	279,472	2,382,757	22,048	282,501	5,404,284	2,568,265	330,972	2,236,751	1,037,545
St. Louis Southwestern	24	328,527	314,274	706,365	104,903	88,874	6,997	338,491	.....	26,888	566,153	140,212	42,000	98,130	—106,688
Staten Island Rapid Transit	87	415,045	63,184	528,170	45,142	27,883	15,711	175,663	.....	19,403	283,254	244,916	44,373	19,942	62,934
Texarkana & Fort Smith	129	223,479	97,777	431,249	53,028	66,168	11,652	208,848	2,237	24,324	366,258	64,991	24,000	41,097	—43,914
Ulster & Delaware	3,622	24,549,413	5,742,395	33,828,572	4,494,630	4,450,585	704,349	10,012,730	681,018	1,061,021	21,226,352	12,602,219	2,201,948	10,398,410	—1,986,308
Union Pacific															

* Merged with Missouri Pacific on June 1, 1917.

‡ Reorganized on June 1, 1917.

Committee on Restoration and Employment

At the special meeting of the Association of Railway Claim Agents held at Chicago on August 10, the question was brought up of appointing a committee to consider ways and means of providing for those who are injured by reason of the war or from any other cause, and incapacitated for the work in which they were formerly employed.

After considerable discussion the following committee, to be known as the Committee on Restoration and Employment, was appointed: F. V. Whiting, chairman, general claims attorney, New York Central; John S. Rockwell, general agent, Buffalo, Rochester & Pittsburgh; S. J. Peterson, general claim agent, Union Pacific; H. B. Hull, general claim agent, Illinois Central; C. W. Egan, general claim agent, Baltimore & Ohio.

St. Louis-San Francisco Establishes School for Women

The St. Louis-San Francisco has undertaken the employment of women to fill such vacancies as occur from time to time where the work can be satisfactorily handled by women. In order to handle the work intelligently the company has organized a "bureau of employment for women," and G. E. Whitlam, inspector of transportation and maintenance, has been placed in charge, with headquarters at Springfield, Mo. The duties of the bureau will be: (1) To list every woman in the employ of the company as regards her present occupation, salary and ability, so that provision may be made for finding better positions for those in its employ and filling their positions with other women, which will result in the present women employees being given promotion according to their ability. (2) To canvass the entire railroad in order to ascertain what positions can be filled by women when vacancies occur. (3) To provide women for vacancies now existing, either by promoting those in the service or by new employees.

The company will give preference to members of families of employees, and to widows and female members of the families of men who were in its service at the time of their death. The object in giving preference to female members of families is: (1) It is thought that they are entitled to this consideration if they wish to work. (2) Having been raised in a railroad environment it is reasonable to assume that they will learn the work readily. (3) Unfortunately some of the employees' families do not have the opportunity to place their girls in desirable and remunerative positions in which the bureau will be in a position to assist. No applications will be considered where the applicant is less than 16 years of age or more than 40. Applicants will be required to fill out an application blank and, if accepted by the examiner, will be required to pass a modified physical examination to insure the fact that none but the physically fit are employed. A fee of one dollar will be charged for the examination, to be paid to the company physician, and an additional fee of one dollar will be charged for vaccination if required. If the applicant is successful in passing the examination, the bureau will list her as available for employment and will undertake to find employment for her in the order in which the application was received, except where previous experience, training and ability may qualify some in preference for the position taken.

The responsibility of the bureau will not end when a woman is placed in a position, but it will undertake to find her a respectable place to board and to see that she is properly instructed in the work to be performed. As a great many of the women desiring to enter railroad service cannot do so on account of lack of previous training, it is the purpose of the St. Louis-San Francisco to organize at Springfield, Mo., as soon as it can be done, a school where women who are selected for employment can secure proper training. The company will provide the tuition, instruction blanks, stationery, etc., free, and the only expense the student will be put to will be for board and room during the period of instruction, the duration of which depends upon the student and the position for which she undertakes to qualify. It is thought that three months' training will be sufficient. In some cases where women members of employees' families desire to enter school, but do not have the funds, the company will undertake to advance a sufficient sum of money to meet expenses, this to be repaid by the students on the instalment plan after they have obtained positions, provided some responsible employee of the company will guarantee reimbursing the company in the event the student fails or refuses to qualify or accept a position.

Illinois Roads Break Coal Traffic Records

In a hearing on the question of fixing coal prices in Illinois before Chief Justice Carter of the Illinois Supreme Court, at Chicago on August 17, R. H. Aishton, president of the Chicago & North Western, and Charles H. Markham, president of the Illinois Central, showed that the carriers of Illinois, as well as those of the other states, have moved more coal in recent months than ever before in their history.

Mr. Markham stated that one of the first orders issued by the Railroads' War Board provided that preference be given to the movement of coal and iron ore, and that every effort be made to secure increased car efficiency. The operation of the railroads of the United States by the board as a single system, eliminating individual and competitive activities, and the extraordinary efforts put forth by both carriers and shippers to increase car mileage and car loading, resulted in an increase of 16 per cent in freight traffic in May, the first full month following the organization of the board, with practically the same number of cars and locomotives as in the corresponding month in 1916. For the four months, April to July, inclusive, the coal-carrying roads of Illinois represented at the hearing (the Illinois Central, the Chicago & North Western, the Chicago & Eastern Illinois and the Chicago, Burlington & Quincy) loaded 7,173,746 tons more coal than in the corresponding period in 1916. Mr. Markham was of the opinion that even better records would be achieved if the State Public Utilities Commission made certain changes in demurrage and reconsignment rules recommended in a report recently prepared by a committee representing the coal operators and railroads following conferences with the State Council of Defense.

Mr. Aishton stated that reports for April, May, June and July, 1917, indicated an abnormally large movement of both anthracite and bituminous coal by the railroads of the country. During that period 753,451 cars of anthracite coal were handled on nine roads, or an increase of 20 per cent over the previous year; and 3,448,999 cars of bituminous coal were handled on 110 railroads, an increase of 28 per cent over 1916. Coal movements, he said, had never before averaged so many miles per day, and through the co-operation of shippers the average load of coal per car has been increased nearly 10 per cent, which has been automatically reflected in an increase of 10 per cent in the supply of empty cars. The Chicago & North Western, for example, handled 249,996 tons of coal in average carloads of 40.6 tons in April, 1916, while in the same month of 1917 it handled 566,728 tons, with an average load per car of 43.3 tons. The increase in the amount of coal handled was approximately 100 per cent, and the increase in the average carload 9 per cent.

Railroads in general are and have been storing coal, although this practice increases the cost of coal on the locomotive practically 55 cents per ton—15 cents for unloading, 15 for loading and a deterioration of 25 cents a ton. In the case of the Chicago & North Western 800,000 tons are being stored at an estimated cost of $400,000. The railroads are undergoing this sacrifice in order to make gondola cars available for commercial business next winter. The result has been accomplished by the carriers in the face of a very large increase in regular commercial traffic, in military traffic, and in special movements of material of all kinds for the building of ships, and for the construction of cantonment camps. In addition there has been a complete change in the natural flow of coal traffic. In ordinary years 31,500,000 tons of coal are shipped by lake from Ohio and West Virginia to the Northwest. This year a shortage of vessel tonnage will result in a decrease of from 10 to 15 million tons in the receipts from those fields, which has necessitated the movement of additional coal by rail from Illinois, Indiana and Kentucky fields.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

Traffic News

The summer meeting of the National Industrial Traffic League was held at the Hotel Statler, Buffalo, N. Y., on August 23 and 24.

The National Shippers Conference will meet at Chicago, August 31, to consider what action to take if the railroads again ask for a rate increase.

The freight traffic department of the Baltimore & Ohio is working out a plan for "sailing days" for l. c. l. freight similar to the methods recently adopted by the Pennsylvania and the Pere Marquette.

The Railroad Commission of Louisiana will hold a hearing at Baton Rouge on September 5 to consider the application of the railroads of the state for an advance of 15 cents a ton on intrastate coal and coke rates.

The Southern Pacific has filed application with the Railway Commission of California for permission to increase one-way and monthly commutation fares on suburban passenger trains between San Francisco, Cal., and Alameda county points.

The dining car department of the Rock Island Lines announces the inauguration of tray service in passenger coaches. Under the arrangement a waiter will pass through the cars during meal hours with coffee, sandwiches, doughnuts and hard boiled eggs for sale to passengers at prices ranging from 5 to 10 cents each.

Illinois railroads on August 17 petitioned the State Public Utilities Commission of Illinois for a reduction in the free time to be permitted for the unloading and loading of open top cars from 48 hours to 24 hours. They also asked the abolition of the 24 hours' free time permitted in connection with the reconsignment of open top cars. The railroads took the action upon the recommendation of the State Council of Defense.

R. J. Clancy, assistant to the general manager of the Southern Pacific at San Francisco, recently issued a statement illustrating the inexpensiveness of transportation service. It costs more, he said, to send a letter through the mails from New York to San Francisco than to ship a $5 hat the same distance by freight. Shoes are loaded into a car and hauled 3,000 miles to the Pacific Coast for one-third the cost of a shave. A pound of live beef from Nevada is hauled more than 300 miles to San Francisco over a mountain range a mile and one-half high for about a third of a cent. A 15 per cent increase in freight rates applied to the shipment of a $35 suit of clothes, a $5 hat, an $8 pair of shoes, 30 dozen eggs and 7 pounds of live beef, from New York, Petaluma, Cal., and Wabuska, Nev., respectively, to San Francisco would amount to less than 5 cents.

Caution as to Shipper's Order on Grain, Hay and Feed

Shippers of grain, hay and feed have been advised by the Bureau of Markets, United States Department of Agriculture, to be on the lookout for what is known as "shipper's order bill of lading" transactions with unknown or irresponsible persons. Shipping carlots to such buyers under no obligation other than to pay for the shipment if they finally take it out of the cars tends to encourage speculation and is liable to increase freight congestion. Some of these buyers order products shipped in the hope that the price will go up in the meantime and enable them to sell locally to a local dealer who will pay cash. Unless they succeed in selling to others, many of these "shipper's order" consignees have insufficient capital to pay for the goods which sometimes fall back on the shipper.

In a case recently investigated by the department a man without financial standing, who posed as a commercial company, succeeded in purchasing large shipments of hay and mill feed. As there was no advance in price, and as he had no cash with which to meet the drafts, he held the goods for several weeks in the cars on the track. Some of the cars were on the track for over 20 days before unloading. When he succeeded in

selling a car, instead of paying his own cash for it, he sent his customer to the bank to release the draft. The day the department investigator was on the ground this man had 13 cars of hay and 9 cars of mill feed on the track, papers for 17 more cars en route, and a number more still to be shipped. It was stated locally that in the same kind of transaction in the past a severe decline in price rendered this individual unable to pay for 30 cars of produce, which the shipper was forced to sell at a material loss.

"94,839 Pounds of Catalogues in One Car"

Putting 94,839 pounds of catalogues into one box car is the way a New York shipper and officials of a railroad it used answered in concrete fashion the plea of the Railroads' War Board to make one freight car do the work of two.

The books—bulky affairs—made 16 truck-loads when they were carted to the Lehigh Valley Pier 34. They were catalogues of the National Cloak & Suit Company bound for a western distributing point, and ordinarily would have required two box cars.

The traffic manager decided it was possible to get them all into one car and secured that result through the co-operation of the Lehigh Valley.

Keeping Tab on Live Stock Shipments

On August 16 there were 3,115 carloads of live stock on the railroads of the United States destined to some 100 markets. Of these cars, 1,772 were loaded with cattle, 699 with hogs, 289 with sheep, 105 with horses and mules, and the rest with mixed stock. The greatest number of cars for any point were bound to Chicago, with Kansas City second, Fort Worth third, and St. Paul fourth.

These are the figures that are being compiled daily by the Bureau of Markets of the United States Department of Agriculture with the co-operation of 521 division superintendents of all railroads west of the Allegheny mountains, representing about 225,000 miles of line, who nightly report these facts by telegraph. The Bureau receives nightly an average of 300 such wires from division superintendents. A night force of telegraph operators and statistical clerks receives and tabulates this information, so that it can be wired to market points at 7 a. m., eastern time.

A tabulated summary of the loadings is wired daily, including Sunday, to the local offices of the Bureau of Markets in Boston, New York, Philadelphia, Chicago, Kansas City, Omaha; Portland, Ore.; Fort Worth, Tex., and Washington, D. C., for immediate publication in the press. Thus producers of live stock and members of the live stock and meat trade at the markets have an early morning report, which will assist in gaging more accurately the receipts at all of the live stock markets. The information contained in these reports, those issuing them say, will help to avoid the present costly market gluts, and should decrease the need for the divisions of live stock in transit.

INCREASED FREIGHT AND PASSENGER RATES IN RUSSIA.—The consulate general at Moscow, Russia, has reported under date of June 25 that the Provisional government has decided to increase passenger tariffs on the railroads 50 per cent, and freight tariffs 200 per cent.

INCREASED FREIGHT IN URUGUAY.—A decree of June 21, 1917, by which the Uruguayan government authorizes the Central Uruguay Railway Company to collect a special surcharge, has settled for the present a controversy of several months with respect to railway rates.

ELECTRIC MOTORS FOR RAILWAY IN PERU.—Sr. Benjamin La Torre, of Cuzco, Peru, has informed Commercial Attaché William F. Montavon, at Lima, that he desires to obtain information with regard to electric locomotives from the United States for possible use on the Cuzco-Santa Ana Railway, an extension out of Cuzco of the Southern Railway of Peru. He is interested in both the construction and operation of the road. Although it will open up a region of some importance, he expects light traffic at first, and suggests the possibility of using locomotives running on storage batteries.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from August 20 until December 18 proposed increases in carload rates on wheat from Omaha and Kansas City to Jackson and Meridian, Miss.

The Interstate Commerce Commission has suspended from August 20 until December 18 the operation of a proposed increased charge via express companies, exclusive of Wells, Fargo & Co., for the transportation of empty fish cars in express service. The present charge is 10 cents per mile per car, and the charge proposed is 25 cents.

COURT NEWS

Off-the-Line Telegraph and Railroad Service

In a suit brought by the Postal Telegraph-Cable Company against the Chicago Great Western, Judge Evan Evans in the United States District Court at Chicago sustained the order of the Interstate Commerce Commission, declaring invalid contracts between railroads and telegraph companies by which free off-the-line service is given on both sides. In conformance with this decision the telegraph company must pay for its off-the-line railroad service, and the railroad company for its telegraph service off its lines, notwithstanding any contracts. The holding is in direct conflict with the decision of Judge Mayer in the United States District Court in New York in a suit brought by the Baltimore & Ohio against the Western Union Telegraph Company, which was later sustained by the United States Court of Appeals of the Second Circuit.

Injuries to Passenger by Others

A passenger sued a railroad for injuries received by her when, as she reached the center of a car platform in boarding the train, she was thrown against the brake wheel by a man emerging from the car. It did not appear that the car was crowded or that there was any commotion or disturbance. The Massachusetts Supreme Judicial Court held the railroad not liable, under the rule that a common carrier is not responsible for injuries to a passenger caused by the misconduct of others, which it could not have foreseen or guarded against.—Eaton v. N. Y. N. H. & H. (Mass.), 116 New England, 815. Decided May 26, 1917.

Objection to Railroad Reorganization

The Circuit Court of Appeals, Fifth Circuit, holds that where the owners of 80 per cent of the bonds secured by a railroad mortgage had joined in a plan of reorganization, and it was still open to an objecting bondholder, who was acting purely in his own interests, and not for other minority bondholders, to join in such plan, a confirmation of a sale to a reorganization committee would not be denied, and a resale ordered merely for the purpose of coercing the committee, by repeated orders of resale, to pay such bondholders the par value of the bonds.—Simon v. New Orleans, Texas & Mexico, 242 Fed., 62. Decided April 28, 1917.

Construction of Safety Appliance Act

The Federal district court for the Eastern District of Kentucky holds that the Safety Appliance Act, sect. 4, which provides that a car properly equipped, which has become defective or insecure while in use, "may be hauled from the place where such equipment was first discovered to be defective or insecure to the nearest available point where such car can be repaired," without liability for the penalties imposed, does not permit a railroad company to move, without penalty, from one point to another, a defective car, not known to be defective, and which is not so moved for the purpose of repair, although in fact it

is hauled to the nearest available point for repair, and is there repaired.—United States v. Chesapeake & Ohio, 242 Fed., 161. Decided October 14, 1916.

Conflicting Freight Rates

The Interstate Commerce Commission prescribed maximum rates between Shreveport, La., and points in Texas, prohibited the charging of rates between such points higher than those applied for like distances between points in Texas, and ordered the railroad companies to cease applying the classification provisions then maintained to transportation between points in Texas. A compliance with this order by the railroad companies would subject them to a multiplicity of suits by the State Railroad Commission, and by shippers for failure to comply with the rates prescribed by the State Railroad Commission, while noncompliance therewith would also subject them to a multiplicity of suits with liability to large penalties. The Federal district court for the Western District of Texas holds that the companies are entitled to a temporary injunction restraining the State Railroad Commission and shippers who are threatening suit from instituting any suits pending an action for a permanent injunction based on the failure of the railroad companies to comply with the state rates so far as in conflict with the rates prescribed by the Interstate Commerce Commission.—Eastern Texas v. Railroad Commission, 242 Fed., 300. Decided April 20, 1917.

No Authority to Prescribe Unremunerative Rates

The district court for the Western District of Missouri holds that, assuming that Missouri Public Service Commission Law, sect. 35, providing that nothing therein, or in any other law, shall limit the power of the commission to order the sale of and prescribe reasonable and just maximum fares for commutation tickets, authorizes the commission to order the sale of suburban commutation tickets, and to prescribe rates therefor, where a carrier's earnings fall short of a fair return to any extent, the commission cannot prescribe commutation rates which will still further reduce such earnings, even though to a comparatively negligible extent, and such action is not authorized by reason of local public demand or interest, or by the commission's views of the possible beneficial effects of such rates on the company's business.—Kansas City, C. C. & St. J. v. Barker, 242 Fed., 310. Decided May 27, 1917.

Hours of Service Act—Available Excuses

The Circuit Court of Appeals, Sixth Circuit, holds that, under section 3 of the Hours of Service Act, where there is a delay from unavoidable accident, or a cause not known to the railroad's agents when a freight train leaves its terminal, and which could not have been foreseen, the railroad is entitled to add to the 16 hours permitted by statute all the delay, no more and no less, which thereafter occurred as the result of this cause, provided the following conditions existed: (a) That from the beginning of the trip, and even before it became apparent, or should have become apparent, to the train despatcher that there was danger of not finishing the trip within the time, the railroad used reasonable diligence to avoid delays; (b) that as soon as it became apparent, or should have become apparent, that there was any danger of not getting through on time, the railroad used a very high degree of effort or extreme diligence to get the train through to the end of the run within the time limit; (c) that as soon as it became fairly probable that excess service would otherwise be necessary, the railroad used that same high diligence to prevent excess service either by laying up the train or by sending relief, or in any other practicable way; (d) that continually and until the service ended, the railroad used the same high diligence and by the same means, to the end that the excess service, if any, should be as short as possible.—B. & O. v. United States, 242 Fed., 1. Decided May 8, 1917.

BRITISH INVENTIONS DURING THE WAR.—During the year 1916, the report of the British comptroller general of patents states, applications were filed for 18,602 new patents. The number of applications during the preceding year was 18,191.

Equipment and Supplies

FREIGHT CARS

THE CHICAGO & ALTON has ordered 200 gondola car bodies from the Haskell & Barker Car Company.

THE SEMET-SOLVAY COMPANY, Syracuse, N. Y., has ordered 100 hopper cars from the Haskell & Barker Car Company.

THE UNITED STATES GOVERNMENT has increased its orders for standard gage cars for service in France from 6,000 to 9,000, each individual order having been increased 50 per cent. This now makes a total of 9,000 standard gage cars, and 2,997 narrow gage cars. There remain orders for 5,000 more cars to be placed.

MISCELLANEOUS

THE TEXAS & PACIFIC has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 400-ton, 2 track coaling plant, for erection at Mingus, Tex.

THE ELGIN, JOLIET & EASTERN has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 150-ton reinforced concrete, 2-track automatic electric coaling plant for installation at South Gate, Illinois Steel Works, Joliet, Ill.

THE OREGON SHORT LINE has awarded a contract to the Roberts & Schaefer Company, Chicago, for two 150-ton reinforced concrete, 3-track automatic electric coaling plants and sanding plants, for installation on its lines at Dillon and Melrose, Mont.

THE CHICAGO SHORT LINE has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 100-ton coaling plant, equipped with a Duplex shallow pit loader and a "Rand S" measuring coal loader, for issuing and recording all coal passed to locomotives.

THE PENNSYLVANIA LINES WEST OF PITTSBURGH has awarded a contract to the Roberts & Schaefer Cmpany, Chicago, for a 500-ton, 3-track reinforced concrete and steel counterbalanced bucket coaling plant of the automatic type, for installation at the New Harthorne Yards, Indianapolis, Ind.

THE MONONGAHELA RAILROAD has awarded a contract to the Roberts & Schaefer Company, Chicago, for the building of a combined 200-ton concrete, 3-track coaling plant, electric cinder handling plant, and a "Rand S" gravity and sand plant, all of concrete construction, to be erected immediately at Brownsville, Pa.

THE FIRST SUBMARINE.—The first submarine boat of which history makes any record was built by a Dutchman, named van Driebel, in 1640. The boat was built in England with money said to have been advanced by King James I. According to reports the vessel had a unique ballasting system. There was a number of goatskin bags placed under the deck between two large planks. These bags, when filled with water, caused the vessel to sink. To cause it to rise again the bags were pressed together again with a windless arrangement, forcing the water out, and thus giving the boat reserve buoyancy.—*The Engineer.*

ELECTRIC SOLDERING IRON.—A new type of soldering iron consists esentially of two high-resistance heating points, or electrodes, that become incandescent when the current passes through them. As the circuit is closed as soon as the points come into contact with the metal to be heated, the iron is said to become heated to the required degree the moment it touches the work. Besides, the heat is generated at the point of contact and at the spot where the heat is needed when soldering, brazing, or annealing. The iron operates at from six to sixteen volts and the points are made to carry current according to ratings of 150, 250 and 500 watts.—*Machinery.*

Supply Trade News

Howard C. Mull, sales representative of the Verona Tool Works in the Chicago office, has been appointed sales agent in charge of the Chicago territory.

R. G. Taylor, sales representative for the American Car & Foundry Company, has been commissioned captain of ordnance in the Officers' Reserve Corps, and has been assigned to duty at Rock Island, Ill.

Thomas H. Garland, president of the Garland Ventilation Company, Chicago, and inventor of the Garland car ventilator, died in Chicago August 20, following a protracted illness. Mr. Garland was 56 years old.

William L. Allison, vice-president of the American Arch Company, Chicago, who has been in training at the officers' training camp at Ft. Sheridan, Ill., has been commissioned a major in the Officers' Reserve Corps.

Arthur S. Lewis has resigned his position with the Chicago-Cleveland Car Roofing Company to join the sales force of Flint & Chester, Inc., New York, effective September 1. Mr. Lewis as assistant to the president will have charge of sales to railroads and other large corporations. He succeeds W. B. Wise, resigned to go into other business.

Adrian D. Joyce, general manager sales and distribution of the Sherwin-Williams Company, has been appointed by the Federal War Industries Board to membership on a special committee for the standardization of paints and varnishes in connection with war purchases. On the committee with Mr. Joyce are six other prominent paint manufacturers of the country.

TRADE PUBLICATIONS

BRINELL HARDNESS TESTING MACHINE.—The Scientific Materials Company, Pittsburgh, has issued a 12-page pamphlet discussing the hardness testing of materials with special reference to the advantage of measuring the depth of the identation made by the testing ball rather than its diameter. A description is given of the improved American model of the Brinell machine, with the appliances for measuring the depth of the penetration as well as other apparatus used in testing of this kind. The pamphlet also contains tables of hardness values.

COST OF COAL ON SWISS RAILWAYS.—The quantity of coal used yearly by the Swiss Federal railways is as follows: In 1915, 636,298 short tons, or 33 pounds per kilometer of 0.621 mile; in 1916, 652,884 tons, or 34 pounds per kilometer. The average price per ton paid for coal by the Swiss Federal Railways during the past 5 years was as follows: In 1912, $5.27 per ton of 2,204 pounds; in 1913, $5.22; in 1914, $5.17; in 1915, $5.15; in 1916, $6.17.

FREIGHT CONGESTION WORRIES JAPAN.—At the end of 1916 the total amount of freight at the Japanese government railway stations was returned at 285,420 tons, but since then the accumulation has continued, and on June 10, 1917, the total reached 463,130 tons. Lately the number of applications to the railway authorities for forwarding goods has greatly increased as the raw silk season and the time for the planting of rice shoots are approaching. The Japanese Railway Board is said to be endeavoring to devise means of meeting the requirements of the situation, though this is not easy, considering that the maximum transportation capacity of the government railways is not much more than 130,000 tons a month. Mr. Hasegawa, superintending engineer of the Railway Board, referring to this matter, remarks that the chief cause of the enormous increase in railway freight must be attributed to the scarcity of hold space and the consequent rise in freight, much of which has hitherto been carried on ships being now collected on the railways. The railway authorities are doing their best to build trucks and engines, so as to increase the transport capacity, but on account of the short supply of iron and other materials the building of equipment does not proceed as quickly as desired.—*N. Y. Tribune.*

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—Plans have been completed by this company for the building of a second track between Floyd, Mo., and Camden, a distance of approximately 5 miles; between Braddock, Kan., and Walton, a distance of 6 miles; from Goff, Cal., to Bagdad, a distance of 30 miles, and from Glorieta, N. M., to Fox, a distance of about 4 miles. Work has already been started on the new track in California.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has prepared preliminary plans for the construction of a subway under its tracks at Moline, Ill.

GRAND TRUNK.—A contract has been awarded by this company to James Stewart & Co., New York, for the construction of a car repair shop at Port Huron, Mich. The building will be 22 ft. high, 77 ft. wide and 360 ft. long, with brick walls, concrete foundation, and a tar and gravel roof.

KIRBY-BONNER LUMBER COMPANY.—Plans have been completed by this company for the construction of a road from Newton, Tex., to a point 24 miles northeast. The contract for the work will probably be let within the next 10 days, and construction will be started as soon as possible.

LEHIGH & NEW ENGLAND.—A contract has been given to F. H. Clement & Co., Philadelphia, Pa., to build a line from Bethlehem, Pa., 4.82 miles, in a generally westerly direction to Allentown and East Allentown, with an intermediate terminal at Rittersville, and a spur from Rittersville 0.61 miles long. The line is to be built through a rolling country, the approximate cut per mile will be 36,000 cu. yd., approximate fill 47,000 cu. yd., the maximum grade will be 1.5 per cent, and the maximum curvature 10 degrees. There will be 5 reinforced concrete bridges at highway crossings. The line is being built to carry coal and general merchandise.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to the L. J. Smith Construction Company, Kansas City, Mo., for grading in connection with the extension of yards at Parsons, Kan. The work will involve the moving of approximately 275,000 cu. yd. of dirt.

PACIFIC ELECTRIC.—This company has been granted a franchise to extend its line from Santa Ana, Cal., to Tustin, a distance of approximately 6 miles. Work on the extension will be started in the near future.

PENNSYLVANIA LINES WEST.—This company is building a new north-and-southbound yard at Orrville, Ohio, which involves the laying of about 30,000 ft. of track.

PHILADELPHIA & READING.—A contract has been awarded to C. P. Bower, Reading, Pa., for grading at Saucon Creek, south of South Bethlehem, Pa., for an extension to a freight yard north of Saucon Creek, providing for 385 more cars, and for a new yard south of Saucon Creek, with a capacity of 850 cars. The road will also build an engine house providing for six engines at the present time, but planned to ultimately take care of 29, and will construct a coaling station, water station and ash pit.

SAND SPRINGS.—This company has completed plans for the construction of a one-story brick car barn at Sand Springs, Okla. Work will be started on the structure in about two weeks, and will cost approximately $10,000.

YAZOO & MISSISSIPPI VALLEY.—A contract has been awarded by this road to the George B. Swift Company, Chicago, for the construction of a passenger station and power house at Greenwood, Miss. The station will be one story high, 42 ft. wide and 161 ft. long, of brick construction, with concrete foundation and slate and composition roof. The power house will be 26 by 54 ft., and will also be of brick construction. The improvements necessitate the removal and remodeling of the freight house, which will be done by the company's forces.

Railway Financial News

CANADIAN NORTHERN.—This company has sold to Wm. A. Read & Co., $10,000,000 one-year 6 per cent notes, which are being offered at 99.05, or on a 7 per cent basis. These notes are secured by $15,333,000 Canadian Northern general mortgage 4 per cent bonds, guaranteed principal and interest by the Dominion of Canada. The notes are convertible into the bonds at 79.

DENVER & SALT LAKE.—Judge Class in the District Court at Brighton, Colo., has placed this company, which operates 255 miles of line between Denver, Colo., and Craig, in the hands of receivers. Charles Boettcher, president of the company, and William R. Freeman, tax agent for the Atchison, Topeka & Santa Fe, have been appointed receivers.

NEW YORK CENTRAL.—The New York Public Service Commission has authorized this company to guarantee $1,000,000 25-year 5 per cent bonds to be issued by the Boston & Albany. The bonds are to be disposed of at par.

NEW YORK, NEW HAVEN & HARTFORD.—Marcus P. Knowlton and the other trustees appointed under the dissolution decree of October 17, 1914, in the government's Sherman law suit against the New Haven and other defendants, have petitioned the Federal District Court for a further extension of time in which to dispose of the aggregation of stock which they hold and control as a result of the litigation. They hold among other securities a block of 219,198 shares of stock of the Boston & Maine. The dissolution decree directed the trustees to dispose of the stock at private sale or public auction prior to January 1, 1918. Asking for the extension of the time of sale to January 1, 1920, the trustees in the position state that from the time of their appointment to the present time the financial situation of the Boston & Maine has been such as to make it impossible for them to sell the large block of stock without an enormous and unreasonable sacrifice. The other stocks in their possession, the trustees explain, are mainly those of railroads leased or operated by the Boston & Maine, and their market value is seriously affected by the same conditions which affect the stock of that road.

ST. LOUIS-SAN FRANCISCO.—J. W. Kendrick and Frederick H. Ecker have been elected directors, the stockholders having voted to increase the board from 15 to 17, and the executive committee from 7 to 9. Jesse Hirschman has been elected a director to succeed James Speyer, resigned. Mr. Kendrick and Mr. Hirschman have also been elected members of the executive committee. The directors have declared six months' interest (3 per cent) on the adjustment bonds and one year's interest (6 per cent) on the income mortgage bonds, payable October 1.

Authority has been obtained from the Missouri Public Service Commission to issue $6,440,000 of 5 per cent prior lien bonds. The application states that $4,578,900 will be used to reimburse the company for expenditures in acquiring property and improving the system, and $1,862,000 for refunding obligations secured by lien.

INCREASED TRAVEL AT BOSTON TERMINALS.—In June the New Haven and the Boston & Albany handled 3,114,280 passengers in and out of the South Station, against 2,977,151 for the corresponding month last year. This represents an increase of 137,129, or 4.6 per cent. In the same month the Boston & Maine carried 2,320,828 passengers in and out of the North Station, against 2,246,086 last year, an increase of 74,742, or 3.3 per cent. In the six months ended June 30 the travel in and out of the big South terminal aggregated 19,171,063 passengers, against 18,074,601 for the corresponding period last year, an increase of 1,096,462, or 6 per cent. In and out of the North Station the travel was 14,193,405 passengers, against 13,351,703, an increase of 841,702, or 6.3 per cent. The South Station is the busiest in the country. The North Station is second and the busiest used by only one road.

Railway Officers

Executive, Financial, Legal and Accounting

Elisha Lee, general manager of the Pennsylvania, has been made acting vice-president in charge of operation during a leave of absence, which has been granted W. W. Atterbury. See also note in General News.

J. Taney Willcox, assistant secretary of the Pennsylvania Railroad, and of 36 subsidiary corporations of the Pennsylvania System, will attend the officers' training camp, at Fort Oglethorpe, Ga., where he will report for duty on Wednesday, August 22. To fill the resulting vacancy, Harry T. Wilkins, who is at present special agent in the traffic department, and who managed the Pennsylvania Railroad's exhibit at the Panama-Pacific Exposition, has been appointed assistant secretary, effective August 20.

The officers of the Savannah & Atlanta, which has acquired all properties and franchises of the Savannah & Northwestern, are as follows: James Imbrie, chairman of the board, New York; Frank S. Gannon, president, New York; John H. Hunter, vice-president, Savannah, Ga.; C. E. Gay, Jr., vice-president and general manager, Savannah; Robert M. Hitch, secretary, Savannah; Ralph N. Scheffey, assistant secretary, New York; Thomas P. Goodbody, treasurer, Savannah, Ga.; J. E. Grainger, auditor; Hitch & Denmark, general counsel; Wilson Runnette, general freight agent, and J. S. Douglas, superintendent, with headquarters at Savannah.

Edgar S. McPherson, who has been elected vice-president of the Spokane International, with headquarters at Spokane, Wash., was born at Racine, Wis., on October 7, 1881, and entered railway service with the Wisconsin Central as an office boy on June 1, 1898. He was later promoted to secretary to the general superintendent of the same road, and on August 1, 1901, became chief clerk to the general superintendent. On January 15, 1902, he was promoted to secretary to the president, and on June 1, 1909, became associated with the Minneapolis, St. Paul & Sault Ste. Marie in a similar capacity. On February 1, 1910, he was appointed chief clerk to the general manager, and on June 1 of the same year became chief clerk to the president. On January 1, 1916, he was promoted to assistant secretary, and on May 1, 1917, he became assistant to the president of the Spokane International, which position he held until his election as vice-president.

Operating

James Berlingett, general manager of the Virginian Railway, has resigned from that position.

C. J. Adair has been appointed terminal trainmaster on the Chicago & Alton, with headquarters at Chicago.

T. S. Fox has been appointed trainmaster on the Grand Rapids & Indiana, with headquarters at Ft. Wayne, Ind., succeeding R. E. Casey, promoted.

George W. DeGraff, yardmaster of the Central of New Jersey at Cartaret, N. J., has been appointed assistant trainmaster, with headquarters at Jersey City.

J. P. Taylor has been appointed general agent of the Atlantic Coast Line, the Seaboard Air Line and the Southern Railway at Camp Jackson, near Columbia, S. C.

T. J. Hayden, yardmaster of the Southern Railway at Asheville, N. C., has been appointed trainmaster, with headquarters at Asheville, vice C. G. King, assigned to other duties.

John Goodfellow has been appointed trainmaster of the Los Angeles division of the Southern Pacific, with headquarters at Los Angeles, Cal., succeeding J. C. Muir, resigned, effective August 10.

J. P. Connolly, supervisor of mail traffic of the Philadelphia & Reading at Jersey City, N. J., has been appointed supervisor of mail and express traffic, with office at Reading Terminal, Philadelphia, Pa.

O. S. Johnson, chief clerk to the president and general manager of the Minneapolis & St. Louis at Minneapolis, Minn., has been appointed assistant to the general manager, with the same headquarters.

Joseph H. Gumbes, whose appointment as general superintendent of the Western Pennsylvania division of the Pennsylvania Railroad is announced elsewhere in these columns, was born at Oaks Station, Montgomery county, Pa., November 27, 1866. He graduated from the engineering department of the University of Pennsylvania in 1888, and entered railway service as a rodman on the Middle division. In December, 1890, he was transferred to the maintenance of way department at Altoona, and on August 11, 1891, promoted to assistant supervisor at Freeport, Pa. He was transferred to a similar position at Mifflin, Pa., on the middle division, on April 30, 1893. On July 1, 1897, he was promoted to supervisor at Millersburg, Pa. On October 30, 1899, he was transferred to the Monongahela division as supervisor at Dravosburg, and on January 1, 1900, he returned to Mifflin as supervisor. On December 10, 1901, he was transferred to the position of supervisor at New Florence, Pa., on the Pittsburgh division, and on June 1, 1903, was promoted to division engineer of the Monongahela division. On April 1, 1905, he was transferred to division engineer of the West Jersey & Seashore, and on April 1, 1907, to division engineer of the Pittsburgh division. He was promoted to assistant superintendent of the Pittsburgh division on March 3, 1911, and on December 1, 1913, he was made superintendent of the Renovo division, with headquarters at Renovo, Pa. He was promoted to superintendent of the Philadelphia Terminal division on May 1, 1916.

J. H. Gumbes

Arthur B. Clark, whose appointment as superintendent of the Philadelphia Terminal division of the Pennsylvania Railroad is announced elsewhere in these columns, was born at Green Village, Pa., October 1, 1867. He graduated from Lafayette College in 1891, receiving the degree of civil engineer. During his summer vacations in 1889 and 1890 he was employed on the Pennsylvania Railroad as rodman, first entering the service July 1, 1889. After graduation he was employed from September 14, 1891, as rodman on the Philadelphia division at Philadelphia. On July 2, 1896, he was promoted to assistant supervisor, and served in that position on the Altoona and Pittsburgh divisions. On July 1, 1900, he was promoted to the position of supervisor on the Baltimore division of the Northern Central. On July 20, 1901, he was transferred to the Pittsburgh division and located at Pittsburgh, in charge of the track work of the Pittsburgh Yard, in connection with the construction of the new Pennsylvania station. On December 15, 1905, he was promoted to assistant engineer of the Middle and Western divisions of the Philadelphia & Erie. He was subsequently transferred to the same position on the West Jersey & Seashore, thence to the Maryland division of the Philadelphia, Baltimore & Washington, as assistant engineer. On January 15, 1910, he was promoted to principal assistant engineer of the Philadelphia, Baltimore & Washington, and on June 16, 1913, he was made assistant engineer maintenance of way, in charge of roadway and track. On September 28, 1916, Mr. Clark was promoted to the position of superintendent of the Renovo division.

A. B. Clark

W. R. Parsons, trainmaster of the Atlanta, Birmingham & Atlantic at Fitzgerald, Ga., has been appointed superintendent of the Birmingham division, with headquarters at Manchester, Ga., vice F. M. Wooddall, resigned.

J. P. Kavanaugh, terminal trainmaster of the Baltimore & Ohio at Philadelphia, Pa., has been promoted to assistant superintendent in charge of the Baltimore (Md.) terminals, succeeding R. A. Grammes, who was recently given a commission as major in the army; W. H. Lynn, general yardmaster at Cumberland, succeeds Mr. Kavanaugh.

Richard L. O'Donnel, whose appointment as assistant general manager of the Pennsylvania Lines East of Pittsburgh is announced elsewhere in these columns, was born in Philadelphia, November 5, 1860. He graduated from the Philadelphia high school in 1877, and from the Polytechnic College of Pennsylvania in 1882. He entered the service of the Pennsylvania Railroad in 1883, and was employed as rodman, levelman and transitman in the construction department until 1884; as draftsman at Blairsville in the assistant engineer's office of the West Penn division during 1884, 1885 and 1886. In November, 1886, he became assistant engineer in the principal assistant engineer's office at Altoona. He was appointed assistant supervisor at Hollidaysburg in March, 1887, and was transferred in February, 1888, to the same position at Lancaster on the Philadelphia division. Following the flood at Johnstown, May 31, 1889, Mr. O'Donnel was assigned to temporary duty at that point in charge of a force of men. After six weeks' service at Johnstown he was transferred to the Pittsburgh division as assistant supervisor at New Florence. He was promoted in November, 1889, to supervisor in the Altoona yard, and in April, 1891, became assistant engineer of the Tyrone division. He was transferred to the Pittsburgh division as assistant engineer in December, 1894. In February, 1897, Mr. O'Donnel was promoted to assistant superintendent of the Pittsburgh division, and to superintendent of the same division on January 1, 1902. He was appointed general superintendent of the Buffalo & Allegheny Valley division on January 1, 1903, and on March 3, 1911, general superintendent of the Western Pennsylvania division.

R. L. O'Donnel

C. E. Green, trainmaster on the Chicago, Rock Island & Pacific at Des Moines, Iowa, has been transferred to Bureau, Ill., succeeding B. H. Hagelbarger, resigned to enter military service; C. W. Lafler, trainmaster at Omaha, Neb., has been transferred to Des Moines; H. C. Higgins has been appointed trainmaster of the West Iowa division, with headquarters at Omaha.

To complete the organization of the general manager's department of the Pennsylvania Railroad, Richard L. O'Donnel has been appointed assistant general manager of the Lines East of Pittsburgh and Erie. This position has been vacant since April 1. Mr. O'Donnel has been general superintendent of the Western Pennsylvania division, at Pittsburgh, for the past six years. As assistant general manager, he will be located in the general offices at Broad Street station, Philadelphia. J. H. Gumbes, super-

intendent of the Philadelphia Terminal division, has been appointed general superintendent of the Western Pennsylvania division, to succeed Mr. O'Donnel. A. B. Clark, superintendent of the Renovo division, will become superintendent of the Philadelphia Terminal division. He will be succeeded by E. B. John, superintendent of the Delaware division, and P. L. Grove, master mechanic of the West Philadelphia shops, will become superintendent of the Delaware division.

Traffic

Hugh Miller has been appointed commercial agent of the Delaware, Lackawanna & Western at New Haven, Conn., vice Robert H. Martin, resigned to engage in other business.

R. C. Wharton has been appointed general agent of the Georgia Railroad at Macon, Ga., vice W. E. Mobley, assigned to other duties. F. W. Boschert has been appointed commercial agent at Memphis, Tenn., succeeding Mr. Wharton.

N. H. Hall has been appointed commercial agent of the Gulf Coast Lines, with headquarters at San Francisco, Cal., succeeding C. F. Northrup, resigned; L. G. Wilson has been appointed commercial agent, with headquarters at Los Angeles.

F. H. Donahue, traveling passenger and freight agent of the Missouri Pacific at Milwaukee, Wis., has been appointed general agent of the passenger and freight departments, with the same headquarters, succeeding H. N. Atwood, transferred.

Sheldon A. Volkman, general agent on the Great Northern at St. Paul, Minn., has been appointed general agent, refrigerator service, succeeding O. W. Farrell, assigned to other duties; H. E. Kendree has been appointed general agent, with headquarters at St. Paul.

G. R. Piper, general agent of the Atchison, Topeka & Santa Fe at Atchison, Kan., has been appointed division freight agent at Wichita, succeeding E. E. Hook, resigned to enter other business; M. C. Burton, traveling freight agent, with headquarters at Hutchinson, has been promoted to general agent at Atchison.

B. Z. Ruff, commercial agent of the Southern Railway at Spartanburg, S. C., has been appointed commercial agent, with office at Savannah, Ga., succeeding G. S. Hinkins, who has accepted service with the American Railway Association, and C. J. Danehey, traveling freight agent at Columbus, S. C., has been appointed commercial agent at Spartanburg, vice Mr. Ruff.

C. A. Werlich, whose appointment as assistant general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age Gazette* of August 10, entered railway service with the Iowa Central in 1888 as a clerk in the local freight office of Oskaloosa, Iowa. In 1890 he was promoted to the general auditing department at Marshalltown, and in 1892 became rate clerk in the general freight office, and later held various positions in that department, including that of chief tariff clerk, until January 1, 1905. On the latter date the general offices of the Iowa Central and the Minneapolis & St. Louis were consolidated at Minneapolis, and he was appointed chief clerk of both roads. On November 30, 1909, when the general freight offices of the Chicago & Alton, the Toledo, St. Louis & Western, the Minneapolis & St. Louis and the Iowa Central were consolidated at Chicago, he became chief clerk of the tariff department for all four roads. On December 15, 1910, he was promoted to chief clerk in the general freight office of the Minneapolis & St. Louis and the Iowa Central at Minneapolis, Minn., and on January 1, 1912, became chief of the tariff bureau of the Minneapolis & St. Louis, which position he held until his recent appointment, as already noted.

Engineering and Rolling Stock

W. F. Seemuth has been appointed signal inspector on the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis.

N. C. Van Natta, who has been appointed chief engineer of the Missouri, Oklahoma & Gulf, with headquarters at Muskogee, Okla., was born at Chicago, on May 8, 1868, and entered railway service with the Chicago, Burlington & Quincy in 1887. In 1909 he became associated with the Gallatin Valley as chief engineer, and in 1910 he went with the Chicago, Rock Island & Pacific. In April, 1912, he became assistant engineer on the Chicago, Milwaukee & St. Paul. In the following year he went with the Chicago & Eastern Illinois in a similar capacity, and in 1916 he was promoted to locating engineer, and in 1917 he became valuation engineer for the Missouri, Oklahoma & Gulf, which position he held until his recent appointment as chief engineer.

Special

Frank A. O'Connell has been appointed editor of the Baltimore & Ohio Employees' Magazine at Baltimore, Md., succeeding R. M. Van Sant and A. W. Grahame, editor and associate editor respectively, who have entered military service.

Railway Officers in Military Service

R. M. Van Sant, editor of the Baltimore & Ohio Employees' Magazine, has been commissioned a lieutenant in the infantry branch at the Officers' Reserve Corps training camp, Fort Myer, Va., and A. W. Grahame, associate editor, will enter military service this month at the same camp.

Major R. Falshaw Morkill, formerly signal engineer of the Grand Trunk Railway System, and now serving overseas in the British Army, has been appointed by the director-general of transportation to take over all signaling work in the area occupied in France and Belgium by the British forces, and is now at general headquarters.

Colonel Charles D. Hine, formerly vice-president and general manager of the Southern Pacific of Mexico, and more recently special representative of the president of the Baltimore & Ohio, has been assigned to the command of the 165th Regiment, formerly the 69th of the New York National Guard. Colonel Hine is a graduate of West Point. He later entered railway service, but became a major of volunteers in the Spanish-American war.

OBITUARY

George S. Cheyney, general superintendent of water companies of the Pennsylvania Railroad since March, 1910, died suddenly on August 16, 1917, at his home in Cheyney, Pa., at the age of 54.

J. H. P. Hughart, president of the Grand Rapids & Indiana, who died at a Grand Rapids (Mich.) hospital on August 16 from injuries sustained from a fall, was born at Pittsburgh, Pa., on December 1, 1854, and entered railway service with the Pittsburgh & Connellsville on September 1, 1869. In 1874 he went with the Grand Rapids & Indiana, and served successively until January 1, 1892, as secretary to the president, purchasing agent, paymaster, secretary, assistant to the president and acting superintendent. On the latter date he was promoted to second vice-president and general manager, and on June 1, 1896, became general manager of the road when it was reorganized. On April 1, 1906, he was elected vice-president and general manager, and in April, 1914, became president.

Mexico Reduces Rates on American Corn.—The Mexican railways have reduced the freight rates throughout Mexico 30 per cent on American corn, according to a report from the American consul general at Mexico City.

Good Team Work on Inadequate Railways.—There had been serious strikes in Italy's railroad force only a few months before the declaration of war, and doubts could reasonably be entertained as to the efficiency of the railroad service, which, moreover, was said to be heavily sprinkled with anarchistic or socialistic theories, and disorganized on account of the recent disastrous earthquakes. But on the day when the army was mobilized, the nation showed what stuff she was really made of, and how the infection both of Germanism and of evil-minded socialism was only skin-deep. Military trains followed each other on the most congested and unmilitary tracks in the world, day and night for days and nights without a single casualty; the railroad force saw to it that everyone concerned did his duty. As a piece of team-work and organization in the face of technical odds (it is remarkable how the geography of Italy stands against her history at all times) it was unprecedented, and may be hard to beat.—*Amy A. Bernardy in the Boston Transcript.*